

December 31, 2004

Luly Massaro
Commission Clerk
89 Jefferson Boulevard
Warwick, Rhode Island 02888

Re: Narragansett Electric Service Quality Plan, Docket 3628

Dear Luly:

Enclosed for filing are ten copies of the testimony of Dr. John Stutz on behalf of the Division of Public Utilities in this Docket, addressing the Settlement Agreement pertaining to the Narragansett Electric Service Quality Plan filed in this docket. Also enclosed for distribution to the Commission and staff are a number of copies of Narragansett's responses to Division data requests. The Division will be entering these responses as exhibits at the hearing in this docket. Thank you for your attention to this matter.

Sincerely,

Stephen Scialabba
Chief Accountant

Cc: service list
enclosures

**STATE OF RHODE ISLAND AND
PROVIDENCE PLANTATIONS**

BEFORE THE PUBLIC UTILITIES COMMISSION

IN RE: NARRAGANSETT ELECTRIC COMPANY : DOCKET No. 3628
SERVICE QUALITY PLAN :

DIRECT TESTIMONY

OF

JOHN STUTZ

On behalf of:

The Rhode Island Division of Public Utilities and Carriers

December 30, 2004

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1 **1. INTRODUCTION AND SUMMARY**

2

3 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.**

4 A. My name is John K. Stutz. My business address is the Tellus Institute (Tellus), 11
5 Arlington Street, Boston, Massachusetts 02116-3411. I am a vice president at Tellus.

6

7 **Q. HAVE YOU PREPARED A DESCRIPTION OF YOUR EDUCATION,
8 EMPLOYMENT AND PROFESSIONAL QUALIFICATIONS?**

9 A. Yes, it is provided in Exhibit JS-1.

10

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

12 A. On August 2, 2004, the Narragansett Electric Company (Narragansett or the Company)
13 filed a Service Quality (SQ) Plan (the Proposed Plan). The Proposed Plan introduced five
14 changes to the Customer Service and Reliability Standards included in an earlier SQ plan
15 (the Original Plan) that the Commission approved as part of the Third Amended
16 Stipulation and Settlement in Docket No. 2930 (the 2000 Settlement). Based on the
17 results of discovery and negotiation, the Company and the Division have entered into an
18 agreement (the SQ Settlement) which builds on the foundation provided by the Proposed
19 Plan to create a new SQ plan (the New Plan). This testimony addresses the New Plan
20 from the Division's perspective.

21

22 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

23 A. If implemented as proposed, the New Plan will provide strong SQ standards, address

1 concerns raised by the Commission in past decisions, and incorporate improvements and
2 updates introduced in the Proposed Plan. Thus, I recommend that the New Plan be
3 accepted by the Commission.

4
5 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?**

6 A. My detailed testimony is presented in the following two sections. The first addresses the
7 need for SQ standards, in general and for Narragansett in particular. It also reviews the
8 various steps leading to the agreement between Narragansett and the Division. The
9 second addresses the New Plan in detail.

10

2. BACKGROUND

1
2
3 **Q. IS THERE A GENERAL NEED FOR SQ STANDARDS?**

4 A. Yes, the regulatory framework itself creates a need for SQ Standards. Under rate base/rate
5 of return regulation there is an incentive for utility management to control costs, and so
6 maximize their opportunity to earn their allowed rate of return. This raises a concern that
7 utility efforts to control costs will adversely affect service quality. SQ Standards address
8 that concern, modifying the incentive so that a utility will seek to preserve or improve
9 service quality while efficiently managing its costs.

10
11 **Q. ARE THESE GENERAL CONSIDERATIONS RELEVANT TO**
12 **NARRAGANSETT?**

13 A. Yes. The 2000 Settlement included a rate freeze and a sharing of earnings. These features
14 create a particularly strong incentive to manage costs. Thus, for Narragansett, the
15 possibility of adverse impacts on service quality was a serious concern. The Company
16 recognized this concern. In a presentation to the Commission in January 2000, the
17 Company explained that the 2000 Settlement would “Improve efficiency allowing for
18 revenue reductions without impairing service quality.” Narragansett went on to explain
19 that the Original Plan would “Establish service quality standards and reporting
20 requirements to ensure that service quality does not deteriorate.”

21
22 **Q. LOOKING AHEAD, DOES THE NEED FOR STRONG SQ STANDARDS**
23 **CONTINUE?**

1 A. Yes. The Seconded Amended Stipulation and Settlement in Docket No. 3167 (“the 2004
2 Settlement”) provides both a rate freeze through 2009 and earnings sharing. This creates a
3 continuing need for strong standards.
4

5 **Q. PLEASE DESCRIBE THE ORIGINAL PLAN.**

6 A. The Original Plan specified four types of SQ Standards. Two were based on customer
7 service measures (customer satisfaction and call response time), and two were based on
8 measures of reliability (System Average Interruption Frequency Index, or SAIFI, and
9 System Average Interruption Duration Index, or SAIDI). The Reliability Standards were
10 applied separately for the Capital and Coastal districts. For performance significantly
11 worse than a benchmark, set at the average (i.e., mean) value for past performance, the
12 Company accrued penalties. For performance significantly better than the benchmark, the
13 Company earned offsets that, within certain limits, could be used to “cancel” penalties.

14 The thresholds for accruing penalties and earning offsets were set at one standard
15 deviation from the mean. Penalties and offsets increased linearly between the first and
16 second standard deviation. Performance two standard deviations or more from the mean
17 received the maximum penalty or offset. For each standard, the maximum offset was set
18 at 75 percent of the maximum penalty. The maximum penalties associated with the four
19 standards total \$2.4 million, \$2 million for reliability and \$400,000 for customer service.
20

21 **Q. PLEASE DISCUSS THE COMPANY’S PERFORMANCE UNDER THE**
22 **ORIGINAL PLAN.**

23 A. The Company’s performance has been mixed. As the data in Exhibit JS-2 show, over the
24 past four years, the Company has incurred penalties totaling \$2,026,729. In four

1 instances the maximum possible penalty was incurred. Much of the poor performance
2 was associated with the Reliability Standards in 2003. They contributed \$1,024,224 out of
3 \$2,026,729, or about 51 percent of the Penalties incurred over the entire 4-year period.

4 When considering the data in Exhibit JS-2, it is important to have the proper
5 context in mind. If Narragansett had incurred the maximum penalty and no offsets in each
6 of the 4 years shown, the Net Impact (i.e., Penalties less Offsets) would have been \$9.6
7 million, not the roughly \$1.7 million shown in Exhibit JS-2. While the reliability results
8 for 2003 are of some concern, the penalties in that year earned were only about 51 percent
9 of the maximum possible.

10
11 **Q. PLEASE DESCRIBE THE PROPOSED PLAN.**

12 A. The Proposed Plan took the Original Plan as its point of departure. Five changes from the
13 Original SQ plan were made. Three involve modifications or updates:

- 14 • Reliability data from Capital and Coastal districts were aggregated.
- 15 • Calls to the Company's computerized Voice Response Unit (VRU)
16 were included when determining the percentage of calls answered
17 within 20 seconds.
- 18 • The time period for the historical data used to develop all of the
19 standards was extended through 2003. Additional historic data was to
20 be added annually. Once ten years of data became available, historic
21 performance was to be based on the most recent ten years of data.

22 For the Reliability Standards, two changes were made to introduce a new methodology
23 that relied on logarithmic data:

- Thresholds for the assignment of penalties and offsets were based on the standard deviation of the natural logarithm of historical SAIDI and SAIFI data.
- Major Events, identified based on the IEEE Standard 1366-2003, *Guide for Electric Power Distribution Reliability Indices*, (the IEEE Standard) were used in place of Extraordinary Events to exclude data when computing the annual values of SAIDI and SAIFI.

Q. IS SOME CHANGE FROM THE ORIGINAL PLAN DESIRABLE?

A. Yes. The SQ Standards included in the Original Plan were developed in late 1999. Since then the Company's business organization, data collection methods and customer service arrangements have evolved. There have also been new developments in the design of SQ Standards. To reflect the current state of affairs, some change is desirable.

The changes included in the Proposed Plan incorporate more recent data, reflecting current management and operations, and introducing new methods. In reviewing the Proposed Plan I considered the impact each change would have on the incentive for service quality. I also took into account the guidance provided in the Commission's decision in Docket No. 3476, dealing with the New England Gas Company (NEGas) Service Quality Plan (the Gas Plan Decision). Based on all of these considerations, and taking into account the information provided by the Company in response to discovery, I worked with the Company and Division Staff to develop the New Plan.

3. THE NEW PLAN

1
2
3 **Q. PLEASE DESCRIBE THE KEY FEATURES OF THE NEW PLAN.**

4 A. The New Plan builds on the five changes proposed in the Proposed Plan. Three of the
5 changes—aggregating reliability data, including calls to the VRU, and use of logarithmic
6 data—were accepted. One change—updating the historic data—was modified.
7 Consideration of another—use of IEEE Standard—was deferred. Finally, an additional
8 change—reduction in the maximum offsets—was added.

9
10 **Q. PLEASE DISCUSS THE REDUCTION IN OFFSETS.**

11 A. In the Original and Proposed Plans, maximum offsets were set at 75 percent of the
12 maximum penalty for each standard. In the New Plan, maximum offsets are reduced to 25
13 percent of maximum penalties. This moves the New Plan in the direction suggested by
14 the Commission in the following two comments made on page 35 of the Gas Plan
15 Decision:

- 16
- 17 • As for the issue of offsets, NEGas' approach would allow bad
18 performance in some measures to be offset by good performance in other
19 measures. The Commission is moving away from this approach.
 - 20 • The Commission does not want to create offsets between measures
21 because it would allow utilities to ignore poor performance in certain
22 service measures.

23 The reduction in offsets is a significant aspect of the New Plan. As the data in
Exhibit JS-2 show the current 75 percent offsets have sometimes allowed poor

1 performance in one area to be significantly offset by good performance in another. The
2 reduction to 25 percent offsets will make this less likely in the future. Further, as I will
3 explain below, the reduction to 25 percent offsets addresses a concern raised by the
4 introduction of the new methodology, making it possible to incorporate the new methods
5 while strengthening the Reliability Standards.

6
7 **Q. PLEASE DISCUSS THE AGGREGATION OF RELIABILITY DATA.**

8 A. Since the Original Plan was developed, the Company has modified the way in which it
9 operates the distribution system, moving from a district basis (Capital and Coastal) to a
10 total Company basis. Aggregation brings the development of the Reliability Standards
11 into line with the Company's current operating practices. It does not affect the incentives
12 for service quality provided by the Reliability Standards.

13
14 **Q. WHAT ABOUT THE INCLUSION OF CALLS TO THE VRU?**

15 A. The current Call Response Standard addresses the Company's ability to respond rapidly
16 to customers seeking to speak with a customer service representative. As the results in
17 Division 1-20 a) show, with the exception of 2001, the Company's record in this area has
18 been quite good. In fact, as shown on Exhibit JS-2, Call Response is the only standard
19 for which, cumulatively, offsets earned have been greater than penalties incurred. As Mr.
20 Sorgman's testimony in support of the New Plan makes clear, the VRU is an increasingly
21 important aspect of the Company's arrangements for dealing with customer calls. Thus, it
22 is reasonable and appropriate to include the VRU as part of the Call Response Standard.

23
24 **Q. PLEASE DESCRIBE THE UPDATING INCLUDED IN THE PROPOSED PLAN.**

1 A. As part of the Proposed Plan the Company proposed extending the time period for the
2 historical data used to develop all of the standards through 2003. Over time, additional
3 years of historic data would be added. For each standard, once ten years of data become
4 available, the Company proposed the use of “rolling averages,” that is setting
5 benchmarks annually using the average of the ten most recent years of historical data.
6

7 **Q. HOW DOES THE NEW PLAN DEAL WITH UPDATING?**

8 A. The New Plan deals with the choice of historic data separately for the customer and
9 Reliability Standards. For the customer standards, data through 2004 are used. For the
10 Reliability Standards historic data are limited to the years 1995 through 2002. The New
11 Plan drops the proposed use of rolling averages. Thus, the possibility that future
12 “automatic” additions of historic data might lower standards—a concern raised by this
13 Commission in the Gas Plan Decision—is avoided.
14

15 **Q. WHAT IS THE IMPACT OF UPDATING ON THE CUSTOMER STANDARDS?**

16 A. The impact of updating can be assessed by comparing the means and standard deviations
17 used to set the standards in the Original Plan with those resulting from updating. This
18 comparison is provided in Exhibit JS-3. As shown in the exhibit, for the Customer
19 Contact Standard the effect of the updating on the mean and standard deviation is
20 negligible. For the Call Response Standard the effect on the mean is small (i.e., a 1.8
21 percent change). However, the impact on the standard deviation is significant.

22 For the Customer Standards, a substantial increase in the standard deviation
23 reduces the likelihood of penalties and offsets equally. Whether this results in a stronger
24 or weaker standard depends on the relative likelihood of penalties and offsets. As shown

1 in Exhibit JS-2, with maximum offsets at 75 percent of maximum penalties, the Call
2 Response Standard produced more offsets than penalties. However, had offsets been at 25
3 percent, the opposite would have occurred—on average penalties would have exceeded
4 offsets by about \$29,000 per year. Given the modest size of this figure, the benefits of
5 having a broader, more inclusive historical basis for the Call Response Standard
6 outweighs the concern created by the larger standard deviation.

7
8 **Q. PLEASE DISCUSS THE UPDATING OF THE RELIABILITY STANDARDS.**

9 A. As the data in Exhibit JS-2 make clear, for the Reliability Standards, addition of data for
10 2003 would be problematic. To avoid this problem, and to limit the use of older data
11 which does not reflect the Company's current data collection methods, the Reliability
12 Standards in the New Plan are based on data for the period 1995 to 2002. Data for the
13 years 1993, 1994, and 2003 which could have been used are omitted.

14 Using data from Division 1-8, Exhibit JS-4 shows the impact of updating on
15 means and standard deviations. With the exception of a roughly 9 percent decline in the
16 mean for SAIDI, the impacts are very small. As the Company response to Division 1-14
17 shows, the change in the mean for SAIDI reflects a shift in data collection technology, not
18 an underlying change in service quality.

19
20 **Q. PLEASE DESCRIBE THE NEW METHODOLOGY.**

21 A. The new methodology introduces the use of logarithmic data in developing the Reliability
22 Standards. In the Proposed Plan two changes were suggested based on this methodology:

- 23 • Calculating standard deviations using the logarithm of the historical SAIDI
24 and SAIFI data, and using resulting values to set the thresholds beyond

1 which penalties are incurred and offsets are earned.

- 2 • Adopting the IEEE Standard which uses the historic distribution of
3 logarithms of daily SAIDI values to identify Major Events. These Major
4 Events replace Extraordinary Events as the basis for excluding data in the
5 computation of the future annual values for SAIFI and SAIDI to which the
6 Reliability Standards apply.

7
8 **Q. ARE BOTH OF THESE CHANGES INCLUDED IN THE NEW PLAN?**

9 A. No, only the first change—use of logarithmic data to set thresholds for penalties and
10 offsets—is included in the New Plan.

11
12 **Q. HOW DOES THE USE OF LOGARITHMIC DATA AFFECT THE**
13 **RELIABILITY STANDARDS?**

14 A. The use of logarithmic data has two effects. First, it changes the definition of the
15 benchmark, from the usual (i.e., arithmetic) mean to the geometric mean of the historic
16 data. The geometric mean of any data set is less than (or, in very special cases, equal to)
17 the arithmetic mean. Thus, the general effect of the new methodology on the means used
18 to set the benchmarks is to strengthen the Reliability Standards. The effect on the
19 standard deviation is a bit more subtle. It arises because, with the use of logarithmic data,
20 the intervals over which penalties can be incurred or offsets earned become asymmetric.
21 This effect of the asymmetry is addressed in Exhibit JS-5.

22
23 **Q. PLEASE EXPLAIN THE CALCULATION PRESENTED IN EXHIBIT JS-5.**

24 A. Use of logarithmic data allows offsets to be earned for performance “sooner” (i.e., for

1 values close to the mean of the historic data) than penalties are incurred. This leads to a
2 situation in which offsets can “cancel” (i.e., exceed or equal) penalties for symmetric
3 performance. To see how this effect arises, it is useful to focus on the point at which the
4 maximum offset is earned. This point is the focus for the calculations shown in Exhibit
5 JS-5.

6 In Exhibit JS-5, the first two rows show the values of SAIDI at which the
7 maximum offset is earned, as well as the amount of that offset. In the next two rows the
8 exhibit shows the symmetric values about the mean and the penalty associated with them.
9 As one would expect, in the Original Plan the offset “cancels” only 75 percent of the
10 penalty. In the Proposed Plan the situation is quite different. The maximum offset more
11 than cancels the corresponding penalty. As shown in the final column of the exhibit, the
12 reduction in offsets included in the New Plan solves the “cancellation problem” created in
13 the Proposed Plan. In fact, the difference between the maximum offsets and the
14 symmetric penalty is larger than in the Original Plan.

15
16 **Q. IS THE SITUATION SIMILAR FOR SAIFI?**

17 A. Yes. While the details would differ, the general results would be similar for SAIFI.

18
19 **Q. FINALLY, PLEASE EXPLAIN THE TREATMENT OF THE IEEE STANDARD**
20 **IN THE NEW PLAN.**

21 A. Adoption of the IEEE Standard would change the way in which the data used to develop
22 SAIFI and SAIDI are selected. The impact of this change needs to be understood before
23 the IEEE Standard is considered for adoption. To meet this need the New Plan provides
24 that the Company will continue to apply the current Extraordinary Event criteria when

1 reporting its reliability results. In addition, the Company will report, for information
2 purposes, annual SAIDI and SAIFI values calculated using the IEEE Standard. This dual
3 reporting will provide the information required to assess the impact of the IEEE Standard.

4 Looking ahead, in part 2d of the New Plan, the Company and Division have
5 agreed that the Company may petition the Commission no sooner than two years after the
6 date of this Agreement to modify the Company's SQ plan to reflect the adoption of the
7 IEEE Standard. The Company will have the burden of proof with respect to any such
8 petition. The Division will be free to take any position on such a petition that the facts
9 may warrant.

10
11 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

12 **A.** Yes, it does.

BACKGROUND AND QUALIFICATIONS

Education and Employment

Dr. Stutz received a B.S. from the State University of New York at Stonybrook in 1965 and a Ph.D. from Princeton University in 1969. Both degrees are in mathematics. After completing his Ph.D., he taught and did research at the Massachusetts Institute of Technology, the State University of New York at Albany where he received tenure, and Fordham University where he held the position of associate professor of mathematics and was co-director of the program in mathematics and economics. He left Fordham to help found Tellus where he has been employed since 1976. Tellus is a non-profit institute. It provides research and consulting services to clients in the public and private sectors in the areas of energy, environmental policy, solid waste management, water resource planning, and sustainable development.

Professional Qualifications

Dr. Stutz has extensive experience in the utility industry, particularly as an expert witness. Since 1977 he has appeared before the Federal Energy Regulatory Commission (FERC) as well as Public Utility Commissions in 39 states, the District of Columbia, and three provinces in Canada. In total, he has appeared in 184 proceedings as shown in the attached table. While most of Dr. Stutz's appearances have been in electric utility proceedings, he has also testified on gas and telecommunications matters. Much of Dr. Stutz's testimony has addressed ratemaking issues. Since 1979, he has appeared as a witness on ratemaking in 126 proceedings. His testimony has addressed a variety of topics, including marginal costs, embedded cost-of-service studies (COSS), service quality standards, and numerous aspects of rate design.

Since the early 1980s Dr. Stutz has testified regularly on behalf of the Staff of the Rhode Island Division of Public Utilities and Carriers on electric ratemaking matters. He participated in the development of the settlements approved in Docket Nos. 2930 and 3617. Over the last few years Dr. Stutz has worked for the New Jersey Division of the Ratepayer Advocate, and the Staff of the Delaware Public Service Commission on issues of service quality reporting and standards.

Dr. Stutz's articles and comments on utility-related subjects have appeared in the *Public Utilities Fortnightly*, *The Electricity Journal*, and elsewhere. His paper with Thomas Austin is cited, in the second edition of Bonbright's *Principles of Public Utility Rates*, as a source of information on electric ratemaking in general and COSS in particular. He was the lead author of *Aligning Rate Design Policies with Integrated Resource Planning*, a report commissioned and published by the National Association of Regulatory Utility Commissioners (NARUC). As NARUC's preface states, Tellus was selected to prepare this report largely because of Dr. Stutz's expertise. In 2004 Dr. Stutz was an invited speaker on electricity markets at the annual CAMPUT conference and at the Delaware PSC Conference on Standard Offer Supply.

Dr. Stutz's Testimony Before Regulatory Commissions

STATE	APPEARANCES		STATE	APPEARANCES	
	<u>Ratemaking</u>	<u>Planning</u>		<u>Ratemaking</u>	<u>Planning</u>
Alabama	1		Minnesota	2	
Arizona	5		Mississippi	1	
Arkansas	1		Nevada	4	3
Canada	10		New Jersey	7	
Colorado	6	4	New York		5
Connecticut	3	3	New Mexico	6	
Delaware	2		New Hampshire	2	
District of Columbia	1		North Carolina	3	
FERC		3	Ohio	5	1
Florida	1	3	Oregon	1	
Georgia		1	Pennsylvania	2	4
Hawaii		1	Rhode Island	22	3
Illinois	1	3	South Carolina	1	
Iowa	1		Tennessee	1	
Kansas	1		Texas	7	1
Kentucky	1		Utah	2	
Louisiana	2		Vermont	3	1
Maine	11	5	Virginia	1	
Maryland	2		Washington		1
Massachusetts	1	4	West Virginia	3	
Michigan	2	12	Wisconsin	1	
				<u>Total</u>	<u>Total</u>
				<u>Ratemaking</u>	<u>Planning</u>
				126	58

DATA ON PENALTIES AND OFFSETS: 2000-2003⁽¹⁾

Standard Type – Measure	2000 (a)	2001 (b)	2002 (c)	2003 (d)	Cumulative (e)
Reliability – Coastal Frequency	\$0	\$0	\$0	\$293,455	\$295,455
Reliability – Capital Frequency	\$0	\$22,727	\$0	\$0	\$22,727
Reliability – Coastal Duration	\$0	\$0	\$0	\$500,000 ⁽²⁾	\$500,000
Reliability – Capital Duration	\$0	\$500,000 ⁽²⁾	\$0	\$230,769	\$730,769
Customer Service – Customer Satisfaction	- \$77,778	\$77,778	\$200,000 ⁽²⁾	\$0	\$277,778
Customer Service –Call Response	\$0	\$200,000 ⁽²⁾	- \$102,632	- \$150,000 ⁽³⁾	- \$52,632
Total Penalties		800,505	200,000	1,026,224	2,026,729
Total Offsets	- 77,788		- 102,632	- 150,000	- 330,420

(1) Data from Narragansett's Year 2003 Service Quality Performance Results, Attachment 2, dated September 2, 2004. Individual penalties are shown as positive numbers. Offsets are shown as negative.

(2) Maximum penalty.

(3) Maximum offset.

IMPACT OF UPDATING ON CUSTOMER STANDARDS
(All Data in Percentages)

Standard	Original Plan⁽¹⁾		New Plan⁽²⁾	
	Mean	Standard Deviation	Mean	Standard Deviation
Customer Contact	79.8	1.8	79.0	2.4
Call Response	76.2	3.8	74.8 ⁽³⁾	12.9 ⁽³⁾

- Note: (1) All data from Exhibit RHM-4, attached to Mr. McLaren's testimony in support of the SQ Settlement.
- (2) Customer contact data from Attachment 1 to the SQ Settlement. Call Response data, showing the effect of updating but not inclusion of VRU, from Division 1-20 b).
- (3) As shown in Attachment 1 to the SQ Settlement, if VRU data are included the mean is 78.0 and the standard deviation is 12.2.

IMPACT OF UPDATING FOR SAIDI AND SAIFI⁽¹⁾

	Historic Time Period	
	1993 to 1999 (Original Plan)	1995 to 2002 (New Plan)
Interruption Frequency (SAIFI):		
Mean	1.11	1.10
Standard Deviation	.22	.22
Interruption Duration (SAIDI):		
Mean	67.52	61.51
Standard Deviation	13.59	11.57

Note: (1) All data from Division 1-8 a).

COMPARISON OF OFFSETS AND PENALTIES FOR SAIPI

	----- Original Plan ⁽¹⁾ -----		Proposed ⁽²⁾ Plan	New ⁽³⁾ Plan
	Coastal	Capital		
Very Good Performance ⁽⁴⁾	.77	.61	.76	.80
Offset ⁽⁵⁾	-\$375,000	-\$375,000	-\$750,000	-\$229,000
Mean of Historic Data ⁽⁶⁾	1.21	1.05	.99	1.05
Equivalent Poor Performance ⁽⁷⁾	1.65	1.49	1.22	1.30
Penalty ⁽⁸⁾	\$500,000	\$500,000	\$625,000	\$592,705

- Notes:
- (1) Data from Exhibit RHM-4, attached to Mr. McLaren's testimony in support of the Settlement.
 - (2) Data from Exhibit RHM-1, attached to Mr. McLaren's testimony filed with the Proposed Plan.
 - (3) Data from Attachment 1 to the Settlement.
 - (4) Score at which maximum offset is achieved.
 - (5) Maximum offset. As in Exhibit JS-2, offsets are shown as negative and penalties as positive.
 - (6) Simple average of the historic data.
 - (7) Symmetrical value about the mean from Very Good Performance.
 - (8) Penalty for Equivalent Poor Performance for the Proposed and New Plans values are developed by linear Interpolation.



Laura S. Olton
General Counsel

November 3, 2004

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

**RE: Docket 3628 - The Narragansett Electric Company's Service Quality Plan
Response to the Division's Data Requests – Set 1**

Dear Ms. Massaro:

Enclosed for filing are 10 copies of The Narragansett Electric Company's response to the Division's first set of data requests in the above-captioned proceeding.

If you have any questions, please feel free to contact me at (401) 784-7667.

Very truly yours,

Laura S. Olton

Enclosures

cc: Docket 3628 Service List

Division Data Request 1-1

Request:

(Ref. page 3, lines 2 to 14) Did Mr. McLaren participate in the negotiations leading to the settlements in Docket Nos. 2930 and 3617? If so, please describe his role in each negotiation.

Response:

Mr. McLaren assumed responsibility for the New England Regulatory Services group in April 2000, shortly after the conclusion of negotiations of the Third Amended Stipulation and Settlement, dated March 14, 2000, in Docket No. 2930. As a result, Mr. McLaren did not participate in the negotiations leading to the settlement in Docket No. 2930.

Mr. McLaren did not participate directly in the negotiations leading to the Distribution Rate Plan Second Amended Stipulation and Settlement in Docket No. 3617; however, as Senior Vice President of New England Distribution Finance, Mr. McLaren had oversight of the Company’s position in Docket No. 3617.

Prepared by or under the supervision of: Robert H. McLaren

Division Data Request 1-2

Request:

(Ref. page 6, line 7 and note 1) Please provide any materials that support the claim made in note 1 that there was an assumption that the performance data distribution was normal.

Response:

By definition, normal distributions, also referred to as Gaussian, are a family of distributions represented by a series of bell shaped curves. The distributions are symmetric; with more data points concentrated in the middle than in the tails, and are defined by two parameters: the mean (μ) and the standard deviation (σ). The mean is the average of the set of data points, while the standard deviation is a measure of how close to the mean the various data points fall. The mean and the standard deviation are the two parameters that describe normal distribution and, when used, the general assumption is that the distribution of the data is “bell-shaped”.

The Original Service Quality Plan approved as part of the Third Amended Stipulation and Settlement in Docket No. 2930 docket used the mean and standard deviation of the yearly reliability metrics to develop the performance targets. Statistical analysis of the Company’s historical performance yielded an average, or mean, and a standard deviation, which when added to, or subtracted from, the mean determined the threshold for performance penalties or penalty offsets. Therefore, inherent in the usage of the mean and the standard deviation in developing the Company’s performance targets is the general assumption that the historical data was normally distributed. Otherwise, a presumed assumption of the Original Service Quality Plan - that there would be equal probability of incurring penalties as achieving offsets - would not only be incorrect, but, would be further distorted by the use of unequal thresholds for penalties and offsets.

Additional information regarding this subject can be found at the following link:
<http://www.robertniles.com/stats/stdev.shtml>.

Division Data Request 1-3

Request:

(Ref. page 9, lines 18 to 21) Please provide a copy of the guide cited.

Response:

Please see attached copy of the IEEE Standard 1366-2003, *Guide for Electric Power Distribution Reliability Indices*, (“IEEE Std. 1366-2003”).

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-4

Request:

(Ref. page 10, line 6 to page 11, line 9) Please provide an analysis showing how the Company’s SQ penalties through 2003 would have changed if the three changes proposed in the cited testimony had been included as part of the original plan. In the analysis, show the effect of each individual change, the first two changes together, and all three changes together. Identify any assumptions made to perform the analysis and provide any supporting materials.

Response:

The three changes proposed in Mr. McLaren’s testimony on page 10, line 6 to page 11, line 9 are as follows:

1. Apply IEEE Std. 1366-2003 to the Capital and Coastal districts;
2. Combine Capital and Coastal districts into one Company on an IEEE Std. 1366-2003 basis, to coincide with the manner in which the Company operates its distribution system – from a district basis to a total company basis; and
3. Include calls to the Voice Response Unit (“VRU”) in its telephone calls answered within 20 seconds performance beginning in the year 2000.

For each of the above changes, the Company is using the same benchmark period as that used in the Original Service Quality Plan approved as part of the Third Amended Stipulation and Settlement in Docket No. 2930. For reliability, the benchmark period includes the years 1993 through 1999 and for calls answered within 20 seconds, the years 1996 through 1999. The performance targets used to compare the impact of the changes versus the results under the Original Service Quality Plan are reflected below. In addition, Attachment 1, pages 1 – 16, contains detailed calculations for the years 2000 through 2003 relative to the impact of the above changes versus the results under the Original Service Quality Plan. Please note that change 2 alone is effectively the same as combining changes 1 and 2 together.

Change 1: Application of IEEE Std. 1366-2003 to the Capital and Coastal districts:

PERFORMANCE STANDARD – SAIFI (IEEE):

SAIFI - Coastal Target	(Penalty)/Offset	SAIFI - Capital Target	(Penalty)/Offset
More than 1.29	(\$500,000)	More than 1.32	(\$500,000)
1.11 – 1.29	linear interpolation	1.07 – 1.32	linear interpolation
0.81 – 1.10	\$0	0.68 – 1.06	\$0
0.70 – 0.80	linear interpolation	0.55 – 0.67	linear interpolation
Less than 0.70	\$375,000	Less than 0.55	\$375,000

PERFORMANCE STANDARD – SAIDI (IEEE):

SAIDI - Coastal Target	(Penalty)/Offset	SAIDI - Capital Target	(Penalty)/Offset
More than 68.0	(\$500,000)	More than 66.3	(\$500,000)
55.0 – 68.0	linear interpolation	53.9 – 66.3	linear interpolation
35.9 – 54.9	\$0	35.5 – 53.8	\$0
29.0 – 35.8	linear interpolation	28.9 – 35.4	linear interpolation
Less than 29.0	\$375,000	Less than 28.9	\$375,000

Change 2: Application of IEEE Std. 1366-2003 to the Combined Company:

PERFORMANCE STANDARD – SAIFI and SAIDI for the Company (IEEE):

SAIFI - Company Target	(Penalty)/Offset	SAIDI - Company Target	(Penalty)/Offset
More than 1.28	(\$1,000,000)	More than 61.5	(\$1,000,000)
1.11 – 1.28	linear interpolation	54.7 – 61.5	linear interpolation
0.83 – 1.10	\$0	43.1 – 54.6	\$0
0.71 – 0.82	linear interpolation	38.3 – 43.0	linear interpolation
Less than 0.71	\$750,000	Less than 38.3	\$750,000

Change 3: Inclusion of calls to the VRU in the calls answered within 20 seconds measure (Note: Because the benchmark period is 1996 – 1999 and the VRU calls are not included until 2000, the performance standards are the same as those under the Original Service Quality Plan):

% Calls Answer Within 20 Sec Target	(Penalty)/Offset
Less than 68.6%	(\$200,000)
68.6% - 72.3%	linear interpolation
72.4% - 80.0%	\$0
80.1% – 83.8%	linear interpolation
More than 83.8%	\$150,000

As noted above for all three changes, the Company is using the same benchmark period as that used in the Original Service Quality Plan approved as part of the Third Amended Stipulation and Settlement in Docket No. 2930. Given this, it is critical to highlight the fact that the Company experienced issues with respect to data collection during this period which, if used to establish the performance targets, would result in targets that are not appropriate because they would be based on historical reliability values that did not capture as much interruption information as today’s systems and processes do.

As fully described in the responses to Division 1-6 c) and Division 1-15, data collection has become more robust over time, with data collected prior to 1996 being the least robust, data collected between 1996 and 1999 being somewhat more robust, and data collected post-1999

being the most robust. This is due to the fact that the purpose of outage management systems was to enable service restoration rather than for data reporting. As such, whenever the Company experienced an extraordinary event (one that was likely to cause interruptions to 10% of customers or more), the data was either not entered into the system, as was the case in the pre-1996 period, or was entered only partially, as was the case from 1996 to 1999. Conversely, after the implementation of the Company’s Interruption Disturbance System (“IDS”) in 1999, as discussed on page 24, lines 11 – 16 of Mrs. Warren’s testimony, all interruption data, including that associated with extraordinary events, was automatically captured by the system. The effect of this on the resultant metrics is further noted within the response to Request 1-15. Thus, the impact of basing the performance targets on data prior to 1999 is that the targets would be established unfairly low given that the early years simply do not capture all relevant outage data.

Prepared by or under the supervision of: Robert H. McLaren

Change #1: Maintaining Capital and Coastal district distinction but applying IEEE 1366-2003, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2000 Original

Narragansett	Potential Offset/ Penalty	Results	Results	Annualized	Maximum	One Std	Dev. Worse Than Mean	Mean	One Std	Dev. Better Than Mean	Maximum	Annual Est.	Proforma Est.
		Thru		Results	Results	Penalty		Dev. Worse Than Mean	Mean		Dev. Better Than Mean	Offset	Offset/ (Penalty) ⁽¹⁾
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2000	0.99	0.99	1.49	1.27	1.05	0.83	0.61	0.000	0.000	0.000	0.000
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2000	1.17	1.17	1.65	1.43	1.21	0.99	0.77	0.000	0.000	0.000	0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2000	60	60	83	70	58	45	32	0.000	0.000	0.000	0.000
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2000	78	78	98	83	68	53	38	0.000	0.000	0.000	0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2000	74.0%	74.0%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000	0.000	0.000
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104	0.156	0.104
Total Offset/Penalty Potential	\$1.90/\$2.4											0.156	0.104

2000 Revised (reflects application of IEEE Std. 1366-2003 to Capital and Coastal Districts)

Narragansett	Potential Offset/ Penalty	Results	Results	Annualized	Maximum	One Std	Dev. Worse Than Mean	Mean	One Std	Dev. Better Than Mean	Maximum	Annual Est.	Proforma Est.
		Thru		Results	Results	Penalty		Dev. Worse Than Mean	Mean		Dev. Better Than Mean	Offset	Offset/ (Penalty) ⁽¹⁾
Reliability - Neco Capital Frequency using IEEE	\$0.375/\$0.5	12/2000	0.99	0.99	1.32	1.06	0.85	0.68	0.55	0.000	0.000	0.000	0.000
Reliability - Neco Coastal Frequency using IEEE	\$0.375/\$0.5	12/2000	0.85	0.85	1.29	1.10	0.95	0.81	0.70	0.000	0.000	0.000	0.000
Reliability - Neco Capital Duration using IEEE	\$0.375/\$0.5	12/2000	59	59	66	54	44	36	29	(0.192)	(0.128)	(0.192)	(0.128)
Reliability - Neco Coastal Duration using IEEE	\$0.375/\$0.5	12/2000	50	50	68	55	44	36	29	0.000	0.000	0.000	0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2000	74.0%	74.0%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000	0.000	0.000
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104	0.156	0.104
Total Offset/Penalty Potential	\$1.90/\$2.4											(0.037)	(0.025)

2000 Result: An increase in penalties of \$128k using IEEE 1366-2003.
⁽¹⁾ Service Quality began May 1 - Penalty/Offset prorated for 8 months.

Change #1 (continued): Maintaining Capital and Coastal district distinction but applying IEEE 1366-2003, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2001 Original

	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru	Results			Mean	Mean				
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2001	1.28	1.28	1.49	1.27	1.05	0.83	0.61	(0.023)	
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2001	1.07	1.07	1.65	1.43	1.21	0.99	0.77	0.000	
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2001	92	92	83	70	58	45	32	(0.500)	
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2001	61	61	98	83	68	53	38	0.000	
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2001	44.8%	44.8%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)	
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)	
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.801)	

2001 Revised (reflects application of IEEE Std. 1366-2003 to Capital and Coastal Districts)

	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru	Results			Mean	Mean				
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2001	0.93	0.93	1.32	1.06	0.85	0.68	0.55	0.000	
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2001	1.08	1.08	1.29	1.10	0.95	0.81	0.70	0.000	
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2001	60	60	66	54	44	36	29	(0.231)	
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2001	64	64	68	55	44	36	29	(0.300)	
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2001	44.8%	44.8%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)	
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)	
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.809)	

2001 Result: An increase in penalties of \$8k using IEEE 1366-2003.

Change #1 (continued): Maintaining Capital and Coastal district distinction but applying IEEE 1366-2003, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2002 Original

	Potential Offset/ Penalty (\$M)	Results	Results	Annualized Results	Maximum Penalty	One Std	Dev. Worse Than Mean	Mean	One Std	Dev. Better Than Mean	Maximum Offset	Annual Est. Offset/ Penalty
		Thru				Dev. Worse Than Mean			Dev. Better Than Mean			
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2002	0.94	0.94	1.49	1.27	1.05	0.83	0.61	\$0.000		
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2002	1.10	1.10	1.65	1.43	1.21	0.99	0.77	\$0.000		
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2002	70	70	83	70	58	45	32	\$0.000		
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2002	78	78	98	83	68	53	38	\$0.000		
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2002	82.6%	82.6%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.103		
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)		
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.097)		

2002 Revised (reflects application of IEEE Std. 1366-2003 to Capital and Coastal Districts)

	Potential Offset/ Penalty (\$M)	Results	Results	Annualized Results	Maximum Penalty	One Std	Dev. Worse Than Mean	Mean	One Std	Dev. Better Than Mean	Maximum Offset	Annual Est. Offset/ Penalty
		Thru				Dev. Worse Than Mean			Dev. Better Than Mean			
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2002	0.90	0.90	1.32	1.06	0.85	0.68	0.55	\$0.000		
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2002	1.09	1.09	1.29	1.10	0.95	0.81	0.70	\$0.000		
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2002	65	65.00	66	54	44	36	29	(\$0.423)		
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2002	74	74.00	68	55	44	36	29	(\$0.500)		
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2002	82.6%	82.6%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.103		
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)		
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$1.020)		

2002 Result: An increase in penalties of \$923k using IEEE 1366-2003.

Change #1 (continued): Maintaining Capital and Coastal district distinction but applying IEEE 1366-2003, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2003 Original

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std	Mean	One Std	Maximum Offset	Annual Est. Offset/ (Penalty)	
		Thru			Results		Dev. Worse Than Mean			Dev. Better Than Mean
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2003	1.03	1.03	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2003	1.56	1.56	1.65	1.43	1.21	0.99	0.77	(\$0.295)
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2003	76	76	83	70	58	45	32	(\$0.231)
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2003	117	117	98	83	68	53	38	(\$0.500)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2003	92.4%	92.4%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.876)

2003 Revised (reflects application of IEEE Std. 1366-2003 to Capital and Coastal Districts)

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std	Mean	One Std	Maximum Offset	Annual Est. Offset/ (Penalty)	
		Thru			Results		Dev. Worse Than Mean			Dev. Better Than Mean
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2003	0.99	0.99	1.32	1.06	0.85	0.68	0.55	\$0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2003	1.26	1.26	1.29	1.10	0.95	0.81	0.70	(\$0.364)
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2003	71	71	66	54	44	36	29	(\$0.500)
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2003	85	85	68	55	44	36	29	(\$0.500)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2003	92.4%	92.4%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$1.214)

2003 Result: An increase in penalties of \$337k using IEEE 1366-2003.

Summary of Converting Districts to IEEE 1366-2003

	Potential Offset/ Penalty (\$M)	Original Service Quality Plan					Revised Service Quality Plan					Difference	
		2000	2001	2002	2003	Total	2000	2001	2002	2003	Total		
		Reliability - NECo Capital Frequency	\$0.375/\$0.5	\$0.000	(\$0.023)	\$0.000	\$0.000	(\$0.023)	\$0.000	\$0.000	\$0.000		\$0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.295)	(\$0.295)	\$0.000	\$0.000	\$0.000	(\$0.364)	(\$0.364)	(\$0.364)	(\$0.068)
Reliability - NECo Capital Duration	\$0.375/\$0.5	\$0.000	(\$0.500)	\$0.000	(\$0.231)	(\$0.731)	(\$0.128)	(\$0.231)	(\$0.423)	(\$0.500)	(\$1.282)	(\$0.551)	
Reliability - NECo Coastal Duration	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.500)	(\$0.500)	\$0.000	(\$0.300)	(\$0.500)	(\$0.500)	(\$1.300)	(\$0.800)	
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	\$0.000	(\$0.200)	\$0.103	\$0.150	\$0.053	\$0.000	(\$0.200)	\$0.103	\$0.150	\$0.053	\$0.000	
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.000	
Total Offset/Penalty Potential	\$1.80/\$2.4	\$0.104	(\$0.801)	(\$0.097)	(\$0.876)	(\$1.670)	(\$0.025)	(\$0.809)	(\$1.020)	(\$1.214)	(\$3.067)	(\$1.397)	

Change #2: Applying IEEE 1366-2003 to combined Company, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2000 Original

<u>Narragansett</u>	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty) ⁽¹⁾	Proforma Est. Offset/ (Penalty) ⁽¹⁾
		Thru	Results			Mean	Mean					
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2000	0.99	0.99	1.49	1.27	1.05	0.83	0.61	0.000	0.000	
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2000	1.17	1.17	1.65	1.43	1.21	0.99	0.77	0.000	0.000	
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2000	60	60	83	70	58	45	32	0.000	0.000	
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2000	78	78	98	83	68	53	38	0.000	0.000	
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2000	74.0%	74.0%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000	
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104	
Total Offset/Penalty Potential	\$1.90/\$2.4									0.156	0.104	

2000 Revised (reflects application of IEEE Std. 1366-2003 to combined Company)

<u>Narragansett</u>	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty) ⁽¹⁾	Proforma Est. Offset/ (Penalty) ⁽¹⁾
		Thru	Results			Mean	Mean					
Reliability - NECo Company Frequency using IEEE	\$0.750/\$1.0	12/2000	0.98	0.98	1.28	1.10	0.95	0.83	0.71	0.000	0.000	
Reliability - NECo Company Duration using IEEE	\$0.750/\$1.0	12/2000	60	60	61	55	49	43	38	(0.385)	(0.256)	
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2000	74.0%	74.0%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000	
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104	
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.229)	(0.153)	

2000 Result: An increase in penalties of \$256k using IEEE 1366-2003.

⁽¹⁾ Service Quality began May 1 - Penalty/Offset prorated for 8 months.

Change #2 (continued): Applying IEEE 1366-2003 to combined Company, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2001 Original

	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		Mean	One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru	Results			Mean	Than Mean					
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2001	1.28	1.28	1.49	1.27	1.05	0.83	0.61	(0.023)		
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2001	1.07	1.07	1.65	1.43	1.21	0.99	0.77	0.000		
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2001	92	92	83	70	58	45	32	(0.500)		
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2001	61	61	98	83	68	53	38	0.000		
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2001	44.8%	44.8%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)		
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)		
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.801)		

2001 Revised (reflects application of IEEE Std. 1366-2003 to combined Company)

	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		Mean	One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru	Results			Mean	Than Mean					
Reliability - NECo Company Frequency using IEEE	\$0.750/\$1.0	12/2001	1.11	1.11	1.28	1.10	0.95	0.83	0.71	(0.045)		
Reliability - NECo Company Duration using IEEE	\$0.750/\$1.0	12/2001	69	69	61	55	49	43	61	(1.000)		
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2001	44.8%	44.8%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)		
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)		
Total Offset/Penalty Potential	\$1.90/\$2.4									(1.323)		

2001 Result: An increase in penalties of \$523k using IEEE 1366-2003.

Change #2 (continued): Applying IEEE 1366-2003 to combined Company, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2002 Original

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std	Mean	One Std	Maximum Offset	Annual Est. Offset/ (Penalty)	
		Thru			Results		Dev. Worse Than Mean			Dev. Better Than Mean
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2002	0.94	0.94	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2002	1.10	1.10	1.65	1.43	1.21	0.99	0.77	\$0.000
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2002	70	70	83	70	58	45	32	\$0.000
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2002	78	78	98	83	68	53	38	\$0.000
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2002	82.6%	82.6%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.103
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.097)

2002 Revised (reflects application of IEEE Std. 1366-2003 to combined Company)

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std	Mean	One Std	Maximum Offset	Annual Est. Offset/ (Penalty)	
		Thru			Results		Dev. Worse Than Mean			Dev. Better Than Mean
Reliability - NECo Company Frequency using IEEE	\$0.750/\$1.0	12/2002	0.98	0.98	1.28	1.10	0.95	0.83	0.71	\$0.000
Reliability - NECo Company Duration using IEEE	\$0.750/\$1.0	12/2002	71	71	61	55	49	43	61	(\$1.000)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2002	82.6%	82.6%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.103
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$1.097)

2002 Result: An increase in penalties of \$1,000k using IEEE 1366-2003.

Change #2 (continued): Applying IEEE 1366-2003 to combined Company, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2003 Original

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std	Mean	One Std	Maximum Offset	Annual Est. Offset/ (Penalty)	
		Thru			Results		Dev. Worse Than Mean			Dev. Better Than Mean
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2003	1.03	1.03	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2003	1.56	1.56	1.65	1.43	1.21	0.99	0.77	(\$0.295)
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2003	76	76	83	70	58	45	32	(\$0.231)
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2003	117	117	98	83	68	53	38	(\$0.500)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2003	92.4%	92.4%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.876)

2003 Revised (reflects application of IEEE Std. 1366-2003 to combined Company)

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std	Mean	One Std	Maximum Offset	Annual Est. Offset/ (Penalty)	
		Thru			Results		Dev. Worse Than Mean			Dev. Better Than Mean
Reliability - NECo Company Frequency using IEEE	\$0.750/\$1.0	12/2003	1.08	1.08	1.28	1.10	0.95	0.83	0.71	\$0.000
Reliability - NECo Company Duration using IEEE	\$0.750/\$1.0	12/2003	75	75	61	55	49	43	61	(\$1.000)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2003	92.4%	92.4%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.850)

2003 Result: A reduction in penalties of \$26k using IEEE 1366-2003.

Summary of Applying IEEE Std. 1366-2003 to combined Company

	Potential Offset/ Penalty (\$M)	Original Service Quality Plan					Revised Service Quality Plan					Difference
		2000	2001	2002	2003	Total	2000	2001	2002	2003	Total	
		Reliability - NECo Capital Frequency	\$0.375/\$0.5	\$0.000	(\$0.023)	\$0.000	\$0.000	(\$0.023)				
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.295)	(\$0.295)						\$0.295
Reliability - NECo Company Frequency							\$0.000	(\$0.045)	\$0.000	\$0.000	(\$0.045)	(\$0.045)
Reliability - NECo Capital Duration	\$0.375/\$0.5	\$0.000	(\$0.500)	\$0.000	(\$0.231)	(\$0.731)						\$0.731
Reliability - NECo Coastal Duration	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.500)	(\$0.500)						\$0.500
Reliability - NECo Company Duration							(\$0.256)	(\$1.000)	(\$1.000)	(\$1.000)	(\$3.256)	(\$3.256)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	\$0.000	(\$0.200)	\$0.103	\$0.150	\$0.053	\$0.000	(\$0.200)	\$0.103	\$0.150	\$0.053	\$0.000
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4	\$0.104	(\$0.801)	(\$0.097)	(\$0.876)	(\$1.670)	(\$0.153)	(\$1.323)	(\$1.097)	(\$0.850)	(\$3.423)	(\$1.753)

Change #3: Include VRU calls in Call Answering metrics, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2000 Original

Narragansett	Potential Offset/ Penalty	Results	Annualized Results	Maximum Penalty	One Std Dev. Worse	Mean	One Std Dev. Better	Maximum Offset	Annual Est. Offset/ (Penalty) ⁽¹⁾	Proforma Est. Offset/ (Penalty) ⁽¹⁾	
		Thru			Results		Than Mean				Than Mean
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2000	0.99	0.99	1.49	1.27	1.05	0.83	0.61	0.000	0.000
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2000	1.17	1.17	1.65	1.43	1.21	0.99	0.77	0.000	0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2000	60	60	83	70	58	45	32	0.000	0.000
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2000	78	78	98	83	68	53	38	0.000	0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2000	74.0%	74.0%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104
Total Offset/Penalty Potential	\$1.90/\$2.4									0.156	0.104

2000 Revised (reflects inclusion of VRU calls in the Call Answering Statistics beginning in 2000)

Narragansett	Potential Offset/ Penalty	Results	Annualized Results	Maximum Penalty	One Std Dev. Worse	Mean	One Std Dev. Better	Maximum Offset	Annual Est. Offset/ (Penalty) ⁽¹⁾	Proforma Est. Offset/ (Penalty) ⁽¹⁾	
		Thru			Results		Than Mean				Than Mean
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2000	0.99	0.99	1.49	1.27	1.05	0.83	0.61	0.000	0.000
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2000	1.17	1.17	1.65	1.43	1.21	0.99	0.77	0.000	0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2000	60	60	83	70	58	45	32	0.000	0.000
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2000	78	78	98	83	68	53	38	0.000	0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2000	76.7%	76.7%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104
Total Offset/Penalty Potential	\$1.90/\$2.4									0.156	0.104

2000 Result: No change as a result of including VRU calls.
⁽¹⁾ Service Quality began May 1 - Penalty/Offset prorated for 8 months.



Change #3 (continued): Include VRU calls in Call Answering metrics, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2001 Original

	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru	Results			Mean	Mean				
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2001	1.28	1.28	1.49	1.27	1.05	0.83	0.61	(0.023)	
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2001	1.07	1.07	1.65	1.43	1.21	0.99	0.77	0.000	
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2001	92	92	83	70	58	45	32	(0.500)	
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2001	61	61	98	83	68	53	38	0.000	
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2001	44.8%	44.8%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)	
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)	
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.801)	

2001 Revised (reflects inclusion of VRU calls in the Call Answering Statistics beginning in 2000)

	Potential Offset/ Penalty	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru	Results			Mean	Mean				
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2001	1.28	1.28	1.49	1.27	1.05	0.83	0.61	(0.023)	
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2001	1.07	1.07	1.65	1.43	1.21	0.99	0.77	0.000	
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2001	92	92	83	70	58	45	32	(0.500)	
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2001	61	61	98	83	68	53	38	0.000	
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2001	50.4%	50.4%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)	
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)	
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.801)	

2001 Result: No change as a result of including VRU calls.



Change #3 (continued): Include VRU calls in Call Answering metrics, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2002 Original

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2002	0.94	0.94	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2002	1.10	1.10	1.65	1.43	1.21	0.99	0.77	\$0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2002	70	70	83	70	58	45	32	\$0.000
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2002	78	78	98	83	68	53	38	\$0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	12/2002	82.6%	82.6%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.103
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.097)

2002 Revised (reflects inclusion of VRU calls in the Call Answering Statistics beginning in 2000)

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2002	0.94	0.94	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2002	1.10	1.10	1.65	1.43	1.21	0.99	0.77	\$0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2002	70	70	83	70	58	45	32	\$0.000
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2002	78	78	98	83	68	53	38	\$0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	12/2002	84.0%	84.0%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.050)

2002 Result: An increase in offsets of \$47k including VRU calls.

Change #3 (continued): Include VRU calls in Call Answering metrics, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2003 Original

	Potential Offset/ Penalty (\$M)	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Results Thru	Results			Mean	Mean				
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2003	1.03	1.03	1.49	1.27	1.05	0.83	0.61	\$0.000	
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2003	1.56	1.56	1.65	1.43	1.21	0.99	0.77	(\$0.295)	
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2003	76	76	83	70	58	45	32	(\$0.231)	
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2003	117	117	98	83	68	53	38	(\$0.500)	
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	12/2003	92.4%	92.4%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150	
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000	
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.876)	

2003 Revised (reflects inclusion of VRU calls in the Call Answering Statistics beginning in 2000)

	Potential Offset/ Penalty (\$M)	Results		Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty)
		Results Thru	Results			Mean	Mean				
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2003	1.03	1.03	1.49	1.27	1.05	0.83	0.61	\$0.000	
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2003	1.56	1.56	1.65	1.43	1.21	0.99	0.77	(\$0.295)	
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2003	76	76	83	70	58	45	32	(\$0.231)	
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2003	117	117	98	83	68	53	38	(\$0.500)	
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	12/2003	93.3%	93.3%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150	
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000	
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.876)	

2003 Result: No change as a result of including VRU calls.

Summary of Including VRU calls in the Call Answering Statistics beginning in 2000

	Potential Offset/ Penalty (\$M)	Original Service Quality Plan					Revised Service Quality Plan					Difference
		2000	2001	2002	2003	Total	2000	2001	2002	2003	Total	
		Reliability - Neco Capital Frequency	\$0.375/\$0.5	\$0.000	(\$0.023)	\$0.000	\$0.000	(\$0.023)	\$0.000	(\$0.023)	\$0.000	
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.295)	(\$0.295)	\$0.000	\$0.000	\$0.000	(\$0.295)	(\$0.295)	\$0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	\$0.000	(\$0.500)	\$0.000	(\$0.231)	(\$0.731)	\$0.000	(\$0.500)	\$0.000	(\$0.231)	(\$0.731)	\$0.000
Reliability - Neco Coastal Duration	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.500)	(\$0.500)	\$0.000	\$0.000	\$0.000	(\$0.500)	(\$0.500)	\$0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	\$0.000	(\$0.200)	\$0.103	\$0.150	\$0.053	\$0.000	(\$0.200)	\$0.150	\$0.150	\$0.100	\$0.047
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4	\$0.104	(\$0.801)	(\$0.097)	(\$0.876)	(\$1.670)	\$0.104	(\$0.801)	(\$0.050)	(\$0.876)	(\$1.623)	\$0.047

Changes #1 through #3: Applying IEEE 1366-2003, combining Districts to Company and including VRU calls, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2000 Original

	Potential Offset/ Penalty	Results	Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty) ⁽¹⁾	Proforma Est. Offset/ (Penalty) ⁽¹⁾
		Thru			Results	Mean	Mean				
<u>Narragansett</u>											
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2000	0.99	0.99	1.49	1.27	1.05	0.83	0.61	0.000	0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2000	1.17	1.17	1.65	1.43	1.21	0.99	0.77	0.000	0.000
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2000	60	60	83	70	58	45	32	0.000	0.000
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2000	78	78	98	83	68	53	38	0.000	0.000
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2000	74.0%	74.0%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104
Total Offset/Penalty Potential	\$1.90/\$2.4									0.156	0.104

2000 Revised (reflects application of IEEE Std. 1366-2003 to combined Company and inclusion of VRU calls)

	Potential Offset/ Penalty	Results	Annualized Results	Maximum Penalty	One Std Dev. Worse Than Mean		One Std Dev. Better Than Mean		Maximum Offset	Annual Est. Offset/ (Penalty) ⁽¹⁾	Proforma Est. Offset/ (Penalty) ⁽¹⁾
		Thru			Results	Mean	Mean				
<u>Narragansett</u>											
Reliability - NECo Company Frequency using IEEE	\$0.750/\$1.0	12/2000	0.98	0.98	1.28	1.10	0.95	0.83	0.71	0.000	0.000
Reliability - NECo Company Duration using IEEE	\$0.750/\$1.0	12/2000	60	60	61	55	49	43	38	(0.385)	(0.256)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.2	12/2000	76.7%	76.7%	68.6%	72.4%	76.2%	80.0%	83.8%	0.000	0.000
Customer Service - Contact Satisfaction Ratings - NECo	\$0.2	12/2000	83.0%	83.0%	76.2%	78.0%	79.8%	81.6%	83.4%	0.156	0.104
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.229)	(0.153)

2000 Result: An increase in penalties of \$256k using IEEE 1366-2003, combining Districts to total Company and including VRU calls.

⁽¹⁾ Service Quality began May 1 - Penalty/Offset prorated for 8 months.

Changes #1 through #3 (continued): Applying IEEE 1366-2003, combining Districts to Company and including VRU calls, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2001 Original

	Potential Offset/ Penalty	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2001	1.28	1.28	1.49	1.27	1.05	0.83	0.61	(0.023)
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2001	1.07	1.07	1.65	1.43	1.21	0.99	0.77	0.000
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2001	92	92	83	70	58	45	32	(0.500)
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2001	61	61	98	83	68	53	38	0.000
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2001	44.8%	44.8%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)
Total Offset/Penalty Potential	\$1.90/\$2.4									(0.801)

2001 Revised (reflects application of IEEE Std. 1366-2003 to combined Company and inclusion of VRU calls)

	Potential Offset/ Penalty	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - Neco Company Frequency using IEEE	\$0.750/\$1.0	12/2001	1.11	1.11	1.28	1.10	0.95	0.83	0.71	(0.045)
Reliability - Neco Company Duration using IEEE	\$0.750/\$1.0	12/2001	69	69	61	55	49	43	38	(1.000)
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.2	12/2001	50.4%	50.4%	68.6%	72.4%	76.2%	80.0%	83.8%	(0.200)
Customer Service - Contact Satisfaction Ratings - Neco	\$0.2	12/2001	77.3%	77.3%	76.2%	78.0%	79.8%	81.6%	83.4%	(0.078)
Total Offset/Penalty Potential	\$1.90/\$2.4									(1.323)

2001 Result: An increase in penalties of \$523 using IEEE 1366-2003, combining Districts to total Company and including VRU calls.

Changes #1 through #3 (continued): Applying IEEE 1366-2003, combining Districts to Company and including VRU calls, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2002 Original

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - NECo Capital Frequency	\$0.375/\$0.5	12/2002	0.94	0.94	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - NECo Coastal Frequency	\$0.375/\$0.5	12/2002	1.10	1.10	1.65	1.43	1.21	0.99	0.77	\$0.000
Reliability - NECo Capital Duration	\$0.375/\$0.5	12/2002	70	70	83	70	58	45	32	\$0.000
Reliability - NECo Coastal Duration	\$0.375/\$0.5	12/2002	78	78	98	83	68	53	38	\$0.000
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2002	82.6%	82.6%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.103
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.097)

2002 Revised (reflects application of IEEE Std. 1366-2003 to combined Company and inclusion of VRU calls)

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - NECo Company Frequency using IEEE	\$0.750/\$1.0	12/2002	0.98	0.98	1.28	1.10	0.95	0.83	0.71	\$0.000
Reliability - NECo Company Duration using IEEE	\$0.750/\$1.0	12/2002	71	71	61	55	49	43	38	(\$1.000)
Customer Service - % Calls Answered w/in 20 seconds - NECo	\$0.150/\$0.2	12/2002	84.0%	84.0%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - NECo	\$0.150/\$0.2	12/2002	76.0%	76.0%	76.2%	78.0%	79.8%	81.6%	83.4%	(\$0.200)
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$1.050)

2002 Result: An increase in penalties of \$953k using IEEE 1366-2003, combining Districts to total Company and including VRU calls.

Changes #1 through #3 (continued): Applying IEEE 1366-2003, combining Districts to Company and including VRU calls, using years 1993 - 1999 as benchmark period as per the Original Service Quality Plan.

2003 Original

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - Neco Capital Frequency	\$0.375/\$0.5	12/2003	1.03	1.03	1.49	1.27	1.05	0.83	0.61	\$0.000
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	12/2003	1.56	1.56	1.65	1.43	1.21	0.99	0.77	(\$0.295)
Reliability - Neco Capital Duration	\$0.375/\$0.5	12/2003	76	76	83	70	58	45	32	(\$0.231)
Reliability - Neco Coastal Duration	\$0.375/\$0.5	12/2003	117	117	98	83	68	53	38	(\$0.500)
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	12/2003	92.4%	92.4%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.876)

2003 Revised (reflects application of IEEE Std. 1366-2003 to combined Company and inclusion of VRU calls)

	Potential Offset/ Penalty (\$M)	Results	Annualized Results	Maximum Penalty	One Std		One Std		Maximum Offset	Annual Est. Offset/ (Penalty)
		Thru			Results	Dev. Worse Than Mean	Mean	Dev. Better Than Mean		
Reliability - Neco Company Frequency using IEEE	\$0.750/\$1.0	12/2003	1.08	1.08	1.28	1.10	0.95	0.83	0.71	\$0.000
Reliability - Neco Company Duration using IEEE	\$0.750/\$1.0	12/2003	75	75	61	55	49	43	38	(\$1.000)
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	12/2003	93.3%	93.3%	68.6%	72.4%	76.2%	80.0%	83.8%	\$0.150
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	12/2003	79.3%	79.3%	76.2%	78.0%	79.8%	81.6%	83.4%	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4									(\$0.850)

2003 Result: A reduction in penalties of \$26k using IEEE 1366-2003, combining Districts to total Company and including VRU calls.

Summary of Applying IEEE Std. 1366-2003, combining Districts to combined Company and including VRU calls

	Potential Offset/ Penalty (\$M)	Original Service Quality Plan					Revised Service Quality Plan					Difference
		2000	2001	2002	2003	Total	2000	2001	2002	2003	Total	
Reliability - Neco Capital Frequency	\$0.375/\$0.5	\$0.000	(\$0.023)	\$0.000	\$0.000	(\$0.023)						\$0.023
Reliability - Neco Coastal Frequency	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.295)	(\$0.295)						\$0.295
Reliability - Neco Company Frequency							\$0.000	(\$0.045)	\$0.000	\$0.000	(\$0.045)	(\$0.045)
Reliability - Neco Capital Duration	\$0.375/\$0.5	\$0.000	(\$0.500)	\$0.000	(\$0.231)	(\$0.731)						\$0.731
Reliability - Neco Coastal Duration	\$0.375/\$0.5	\$0.000	\$0.000	\$0.000	(\$0.500)	(\$0.500)						\$0.500
Reliability - Neco Company Duration							(\$0.256)	(\$1.000)	(\$1.000)	(\$1.000)	(\$3.256)	(\$3.256)
Customer Service - % Calls Answered w/in 20 seconds - Neco	\$0.150/\$0.2	\$0.000	(\$0.200)	\$0.103	\$0.150	\$0.053	\$0.000	(\$0.200)	\$0.150	\$0.150	\$0.100	\$0.047
Customer Service - Contact Satisfaction Ratings - Neco	\$0.150/\$0.2	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.104	(\$0.078)	(\$0.200)	\$0.000	(\$0.174)	\$0.000
Total Offset/Penalty Potential	\$1.80/\$2.4	\$0.104	(\$0.801)	(\$0.097)	(\$0.876)	(\$1.670)	(\$0.153)	(\$1.323)	(\$1.050)	(\$0.850)	(\$3.376)	(\$1.706)

Division Data Request 1-5

Request:

(Ref. page 1 of Exhibit RHM-1) Please reconcile the operation of offsets discussed on page 1 of the exhibit cited, and the operation of offsets described on page 1 of Exhibit 11 in the Settlement in Docket No. 3617. Please identify and explain any differences in the operation of offsets between what is proposed here and the Settlement.

Response:

The application of offsets per page 1 of Exhibit RHM-1 in the Company’s proposed New Service Quality Plan in Docket No. 3628 is consistent with that in the Original Service Quality Plan approved as part of the Third Amended Stipulation and Settlement in Docket No. 2930. In both plans positive performance in one category can be used to offset penalties in other categories in any given year. Offsets earned for the two customer service standards can only be used in the year earned to offset any other standard, while offsets earned in the two reliability standards can either be used in the year earned or in the following year.

Per page 1 of Exhibit 11 in of the Distribution Rate Plan Second Amended Stipulation and Settlement in Docket No. 3617, positive performance in one category can be used to offset penalties in other categories *within a given year only*. Thus, offsets earned in the two reliability standards can no longer be carried forward into the next year.

As a result of the Settlement in Docket No. 3617, the Company will be amending its proposed New Service Quality Plan in Exhibit RHM-1 of Docket No. 3628 to incorporate this provision.

Prepared by or under the supervision of: Robert H. McLaren

Division Data Request 1-6

Request:

(Ref. Exhibit RHM-1, pages 2, 3 and 5, and Exhibit RHM-3, pages 6 and 7) With respect to the proposed standards for Frequency and Duration of Interruptions, please address the following:

- a) Provide values of SAIFI and SAIDI for 1993 which are consistent with the values shown in Exhibit RHM-1 for 1994-2003.
- b) Provide versions of pages 2 and 3 similar to those in Exhibit RHM-1, but based on the data for 1993-1999.
- c) Please provide historic data for SAIDI and SAIFI for 1993-2003 inclusive, similar to that on pages 2 and 3 of Exhibit RHM-1, but developed by excluding only Extraordinary Events as defined on pages 6 and 7 of Exhibit RHM-3.
- d) Provide versions of pages 2 and 3 similar to those in Exhibit RHM-1, but based on the data for 1994-2003 and for 1993-2002 provided in c).
- e) Provide data similar to the annual information for the years 1996 through 2003, shown on Page 5 of 9, for CSR calls only.
- f) Provide data similar to the annual information shown on Page 5 of 9, for the years 2000 through 2003, for VRU calls only.

Response:

- a) Exhibit RHM-1 reflects data using the IEEE Major Event Day (“MED”), or 2.5β , methodology, which requires prior years’ data to establish a threshold for the next year. For the Company, no data upon which to calculate MEDs exists prior to 1993, which means that precise application of the IEEE methodology to the 1993 data cannot be done. While not consistent with the values shown in Exhibit RHM-1 for 1994 – 2003, the actual SAIFI and SAIDI values for 1993, with no exclusions, are 0.983 and 56.8 minutes, respectively.

- b) The table shown below reflects data for the period 1993 – 1999. However, given the lack of complete data sets from this time frame, as explained above, the Company feels that using data from beginning in 1993 is inappropriate. Please note that this data is also reflected in the response to Division 1-4 under “change 2”.

IEEE SAIDI - 93-99

	Log Average	3.8825			
	Log Std. Dev.	0.1181			
	-2 Std Dev.	-1 Std Dev.	Mean	+1 Std Dev.	+2 Std Dev.
Log Normal	3.646	3.764	3.883	4.001	4.119
SAIDI	38.3	43.1	48.6	54.6	61.5

IEEE SAIFI - 93-99

	Average	-0.0463			
	Std. Dev.	0.1452			
	-2 Std Dev.	-1 Std Dev.	Mean	+1 Std Dev.	+2 Std Dev.
Log Normal	-0.337	-0.192	-0.046	0.099	0.244
SAIFI	0.71	0.83	0.95	1.10	1.28

- c) The historic data for SAIDI and SAIFI for 1993 – 2003 inclusive, similar to that on pages 2 and 3 of Exhibit RHM-1, but developed excluding only Extraordinary Events as defined on pages 6 and 7 of Exhibit RHM-3 cannot be computed precisely on a total Company basis. This is due to the fact that during the period from 1993 to 1999 data was not collected for the purposes of reporting. During that time frame outage management systems (“OMS”) were typically used for service restoration purposes, rather than for data reporting.

For the Company, data collection has become more robust over time, with data collected prior to 1996 being the least robust, data collected between 1996 and 1999 being somewhat more robust, and data collected post-1999 being the most robust. Reporting for the post-1999 years reflects the implementation of the Company’s automated data collection and reporting system, Interruption Disturbance System (“IDS”) as described on page 24, lines 6 to line 2 on page 25 of Mrs. Warren’s testimony, and the associated new policies, procedures and database collection schemes. Prior to that period, however, data relative to an extraordinary event (one that was likely to cause interruptions to 10% of the customers or more) was either not entered at all, as was the case for the pre-1996 period, or was partially entered, as was the case from 1996 to 1999. During these years, the Company’s principal use of its outage management system was to support restoration efforts rather than for reporting purposes, and in the case of large storm events, it was more efficient for the Company to focus on restoring customers rather than collecting and entering data for reporting purposes. Thus, because Extraordinary Event data is excluded or is only partially included in the data through 1999, the Company is unable to extract data sufficient to assess and calculate the events that would qualify as Extraordinary on a total Company basis during this period.

Furthermore, because not all data was collected in the periods described, Company performance will appear to be better in those years than in the years post 1999. Setting targets on years that do not have full data sets will result in artificially stringent and unfair targets, in that, they would be based on historical reliability values that did not capture as much interruption information as today’s systems and processes do.

While not entirely precise, the following table represents an approximation of total Company data, excluding the 1993 – 1995 period due to data issues relative to Extraordinary Events discussed above:

Year	Company SAIDI	Company SAIFI
2003	92.0	1.24
2002	71.1	0.98
2001	69.0	1.11
2000	74.4	1.09
1999	68.4	1.05
1998	42.2	0.89
1997	59.5	0.91
1996	72.8	1.03

The above values were developed by adding the Capital and Coastal district reliability data for those days where either district previously met the Extraordinary Event criteria and then excluding any of those days that would meet that same criteria for the Company as a whole. Since the exact individual interruption data for those days with Extraordinary Events is not available in all cases, this is an approximation of the results, in that, it had to be assumed that any Extraordinary Event occurred for the whole day, rather than just during the storm.

- d) As discussed above, the Company feels that using data during the pre-1996 period, which contained incomplete data, would result in the establishment of inaccurate targets. As such, for purposes of response, the Company is providing versions of pages 2 and 3 similar to those in Exhibit RHM-1, but based on data for 1996-2002 and 1996-2003, respectively, as shown below:

Replication of Exhibit RHM-1, pages 2 and 3, for years 1996-2002:

FREQUENCY AND DURATION OF INTERRUPTIONS PER CUSTOMER SERVED

Year	Company SAIDI	Company SAIFI
2002	71.1	0.98
2001	69.0	1.11
2000	74.4	1.09
1999	68.4	1.05
1998	42.2	0.89
1997	59.5	0.91
1996	72.8	1.03

**IEEE SAIDI (Company)
1996 - 2002**

	-2 Std Dev.	-1 Std Dev.	Mean	+1 Std Dev.	+2 Std Dev.
Log Average			4.1639		
Log Std. Dev.			0.1999		
Log Normal	3.764	3.964	4.164	4.364	4.564
SAIDI	43.1	52.7	64.3	78.6	95.9

**IEEE SAIFI (Company)
1996 - 2002**

	-2 Std Dev.	-1 Std Dev.	Mean	+1 Std Dev.	+2 Std Dev.
Average			0.0057		
Std. Dev.			0.0857		
Log Normal	-0.166	-0.080	0.006	0.091	0.177
SAIFI	0.85	0.92	1.01	1.10	1.19

PERFORMANCE STANDARD – SAIFI and SAIDI for the Company (IEEE):

SAIDI - Company Target	(Penalty)/Offset	SAIFI - Company Target	(Penalty)/Offset
More than 95.9	(\$1,000,000)	More than 1.19	(\$1,000,000)
78.7 – 95.9	linear interpolation	1.11 – 1.19	linear interpolation
52.7 – 78.6	\$0	0.92 – 1.10	\$0
43.1 – 52.6	linear interpolation	0.85 – 0.91	linear interpolation
Less than 43.1	\$750,000	Less than 0.85	\$750,000

Replication of Exhibit RHM-1, pages 2 and 3, for years 1996-2003:

FREQUENCY AND DURATION OF INTERRUPTIONS PER CUSTOMER SERVED

Year	Company SAIDI	Company SAIFI
2003	92.0	1.24
2002	71.1	0.98
2001	69.0	1.11
2000	74.4	1.09
1999	68.4	1.05
1998	42.2	0.89
1997	59.5	0.91
1996	72.8	1.03

**IEEE SAIDI (Company)
1996 - 2003**

	-2 Std Dev.	-1 Std Dev.	Mean	+1 Std Dev.	+2 Std Dev.
Log Average			4.21		
Log Std. Dev.			0.2242		
Log Normal	3.760	3.984	4.209	4.433	4.657
SAIDI	43.0	53.8	67.3	84.2	105.3

**IEEE SAIFI (Company)
1996 - 2003**

	-2 Std Dev.	-1 Std Dev.	Mean	+1 Std Dev.	+2 Std Dev.
Average			0.032		
Std. Dev.			0.108		
Log Normal	-0.185	-0.077	0.032	0.140	0.248
SAIFI	0.83	0.93	1.03	1.15	1.28

PERFORMANCE STANDARD – SAIFI and SAIDI for the Company (IEEE):

SAIDI - Company Target	(Penalty)/Offset	SAIFI - Company Target	(Penalty)/Offset
More than 105.3	(\$1,000,000)	More than 1.28	(\$1,000,000)
84.3 – 105.3	linear interpolation	1.16 – 1.28	linear interpolation
53.8 – 84.2	\$0	0.93 – 1.15	\$0
43.0 – 53.7	linear interpolation	0.83 – 0.92	linear interpolation
Less than 43.0	\$750,000	Less than 0.83	\$750,000

- e) The percentage of calls answered within 20 seconds, for CSR calls only, for the years 1996 through 2003 is as follows:

Year	Percent of Calls Answered within 20 Seconds (CSR calls only)
2003	92.4%
2002	82.6%
2001	44.8%
2000	74.1%
1999	76.9%
1998	80.9%
1997	76.7%
1996	70.2%

- f) All calls answered by the VRU are answered within 20 seconds; therefore, the percentage of calls answered within 20 seconds, for the years 2000 through 2003, for VRU calls only, would be 100% for each year.

Prepared by or under the supervision of: Robert H. McLaren, Cheryl A. Warren
and Mark N. Sorgman

Division Data Requests 1-7

Request:

(Ref. pages 1 and 2) Did Ms. Warren participate in the negotiations leading to the settlements in Docket Nos. 2930 and 3617? If so, please describe her role in each negotiation.

Response:

Mrs. Warren joined National Grid USA, the Company’s parent company, in August 2002, after the conclusion of negotiations of the Third Amended Stipulation and Settlement in Docket No. 2930, and therefore did not participate in the negotiations leading to that Settlement. Mrs. Warren did participate in discussions on service quality issues in the context of the negotiations that led up to the initial agreement that was filed with the Commission on June 29, 2004, in Docket No. 3617. However, as indicated in that initial settlement agreement, the parties did not propose any changes in the service quality plan from what had previously been approved in Docket No. 2930. Therefore, Mrs. Warren did not participate in any settlement negotiations in Docket No. 3617 after the June 29, 2004 filing of the initial proposed settlement.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-8

Request:

(Ref. pages 6 to 9) Please address the following:

- a) Provide the SAIFI and SAIDI data used to construct the figures shown on pages 6 and 7.
- b) Please explain how the charts on pages 8 and 9 were developed. Provide the materials that support these charts.

Response:

- a) The SAIFI and SAIDI data used to construct figures 1 and 2 on pages 6 and 7, respectively, is shown in the two charts below.

Figure 1 Data	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Company SAIFI	1.00	1.25	1.54	1.03	0.95	0.90	1.13	1.06	1.20	1.00	1.24
Coastal SAIFI	0.93	1.39	1.59	0.99	1.17	1.05	1.34	1.17	1.07	1.10	1.56
Capital SAIFI	1.05	1.16	1.50	1.05	0.81	0.80	0.99	0.99	1.28	0.94	1.03

Figure 2 Data	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Company SAIDI	57.59	56.05	73.12	67.81	60.66	41.04	74.32	67.02	79.91	73.12	92.12
Coastal SAIDI	63.20	56.90	76.60	56.10	67.00	54.40	100.00	78.00	61.00	78.00	117.00
Capital SAIDI	54.00	55.50	70.90	75.30	56.60	32.50	57.90	60.00	92.00	70.00	76.21

The Capital and Coastal district data for the years 1993 through 1999 is the same as was used to calculate the Company’s performance standards in the Original Service Quality Plan, as reflected on pages 2 and 3 of Exhibit RHM-3. The data for the years 2000 through 2003 also uses the same methodology as in the Original Service Quality Plan. Because the Extraordinary Event data is not included in the early years’ data, the Company is unable to reconstruct what would qualify as an Extraordinary Event for the combined Company. Therefore, while not precise given the lack of data to properly compute Extraordinary Events, for purposes of approximation, the statistics for the combined Company reflect a combination of the values for Capital and Coastal based on the customer split of 61% in the Capital district and 39% in the Coastal district.

- b) The charts on pages 8 and 9 of Mrs. Warren’s testimony reflect the dollar impact of the Capital and Coastal SAIDI and SAIFI performance targets under the Original Service Quality Plan, as shown in the charts below and on pages 2 and 3 of Exhibit RHM-3.

PERFORMANCE STANDARD – SAIFI:

Frequency-Coastal Target	(Penalty)/Offset	Frequency-Capital Target	(Penalty)/Offset
More than 1.65	(\$500,000)	More than 1.49	(\$500,000)
1.44 – 1.65	linear interpolation	1.28 – 1.49	linear interpolation
0.99 – 1.43	\$0	0.83 – 1.27	\$0
0.77 – 0.98	linear interpolation	0.61 – 0.82	linear interpolation
Less than 0.77	\$375,000	Less than 0.61	\$375,000

PERFORMANCE STANDARD – SAIDI:

Duration-Coastal Target	(Penalty)/ Offset	Duration-Capital Target	(Penalty)/ Offset
More than 97.7	(\$500,000)	More than 83.1	(\$500,000)
82.8 – 97.7	linear interpolation	70.4 – 83.1	linear interpolation
52.7 – 82.7	\$0	44.7 – 70.3	\$0
37.7 – 52.6	linear interpolation	31.9 – 44.6	linear interpolation
Less than 37.7	\$375,000	Less than 31.9	\$375,000

The penalty, dead band, and offset amounts for SAIFI and SAIDI performance are plotted such that the x-axis represents the performance target columns and the y-axis represents the (penalty/offset) columns in the charts shown above. For example, examining the blue line in Figure 3 on page 8, it can be seen that if the Coastal district achieves a SAIFI of between 0.99 – 1.43, the performance is in the dead band, resulting in no penalty or offset. Likewise, if the Company achieves a SAIFI of 1.44 or above, a penalty would be due, while an offset would be earned for performance of 0.98 or below. Finally, as per the response to a) above, the Company line reflects a combination of the district results based on the percentage of customers in each district.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-9

Request:

(Ref. page 10, lines 1 to 8) Please address the following:

- a) Please provide the standard referred to on line 3 and the two standards referenced on lines 7 and 8. What body adopted these standards? What was the date of adoption?
- b) Are any of these standards referred to in the Original Service Quality Plan provided in Exhibit RHM-3, or in the text of the Settlement in Docket No. 2930?

Response:

- a) The standards referred to on page 10, lines 1 to 8 of Mrs. Warren’s testimony are versions the *Guide for Electric Power Distribution Reliability Indices* authored by the Institute of Electrical and Electronics Engineers, Inc. (“IEEE”), which is the electrical engineering standards-making body in the United States. The IEEE and the American National Standards Institute (“ANSI”) have both adopted this standard. The first “Trial Use Guide” was adopted in 1998 by the IEEE and the second “Full Use Guide” was adopted by the IEEE in 2001. The most recent standard was approved by the IEEE in December 2003, by the ANSI in April 2004, and has been available for purchase from the IEEE since June 2004.

Please see response to Division Data Request 1-3 for a copy of the IEEE Standard 1366-2003, *Guide for Electric Power Distribution Reliability Indices*, (“IEEE Std. 1366-2003”).

Please also see the attached copy of the IEEE Standard 1366-2001, *Full Use Guide for Electric Power Distribution Reliability Indices*, (“IEEE Std. 1366-2001”). The IEEE Standard 1366-1998, *Trial Use Guide for Electric Power Distribution Reliability Indices*, (“IEEE Std. 1366-1998”) was renamed to the IEEE Std. 1366-2001 with no changes and has been subsequently superceded by the IEEE Std. 1366-2003. As such, it is no longer available for purchase from the IEEE.

- b) No, the IEEE Standards are not referred to in the Original Service Quality Plan provided in Exhibit RHM-3, or in the text of the Settlement in Docket No. 2930.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-10

Request:

(Ref. page 10, lines 17 to 18 and Exhibit RHM-3, pages 6 and 7) Does the definition of Extraordinary Events given in Exhibit RHM-3 play the same general role as the proposed MED in setting performance standards based on SAIDI and SAIFI? If not, please explain the difference in roles.

Response:

While the intent of the Extraordinary Event definition given in Exhibit RHM-3 is similar to the intent of the major event day (“MED”) methodology, they are not the same. Under the Original Service Quality Plan in Docket No. 2930, as shown in Exhibit RHM-3, pages 6 and 7, interruptions are classified as Extraordinary Events if they meet one of the following criteria:

- 1) It was the result of a major weather event which causes more than 10% of a district or total company to be without service at a given time; or
- 2) It was due to the failure of other companies’ supply or transmission to Narragansett Electric customers and restoration of service was beyond the reasonable control of the Company and its employees; or
- 3) It occurred because of an extraordinary circumstance, including, without limitation, a major disaster, earthquake, wild fire, flood, terrorism, or any other event beyond the reasonable control of the Company.

Interruptions that meet criteria 1) and 2) above are straightforward and are therefore automatically excluded from the reporting results. Interruptions that qualify for exclusion under criteria 3) are somewhat subjective in nature and often require careful analysis of individual events to determine whether they indeed qualify for exclusion.

Similarly, a MED is a day that exceeds either a company’s system design and or operational limits. However, unlike Extraordinary Events, under the MED, or IEEE 2.5 β , methodology, *all* events are required to be reported, regardless of why they occurred and whether or not they are classified as a MED. Days that are considered MEDs are objectively determined and will be reviewed on their own merit, and the remainder of the events, which reflect interruptions associated with day-to-day operations, will be used for performance goal/target setting. Separating MED performance from day-to-day operational performance enables better evaluation of a company’s preparation and response to a crisis mode of operation separate from the evaluation of its attention to daily operational performance and allows regulators and utilities alike to review performance more objectively so as to direct any appropriate actions.

Additionally, the Extraordinary Event definition, even if it were to be applied in the same manner as MEDs such that all data is included, does not provide the same rigor as the IEEE 2.5 β methodology, nor does it allow for appropriate comparison of Rhode Island reliability

performance with performance of other states. Because each state has the ability to choose a different definition of what constitutes an Extraordinary Event (and a myriad of them exist today), meaningful comparisons of reliability data are nearly impossible. Furthermore, if a customer wanted to know the level of reliability performance they can expect prior to moving into a state, applying the IEEE MED, or 2.5 β , methodology better enables comparison of Rhode Island performance to that of other states that also utilize the same standard.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-11

Request:

(Ref. page 14, lines 1 to 2) For the period that the current SAIDI and SAIFI standards have been in place, has the Company compared the frequency of extraordinary events with the occurrence of MEDs? If so, please provide that analysis along with all supporting materials. If not, explain why not. Also, please provide any other analyses that address this general issue along with any supporting materials.

Response:

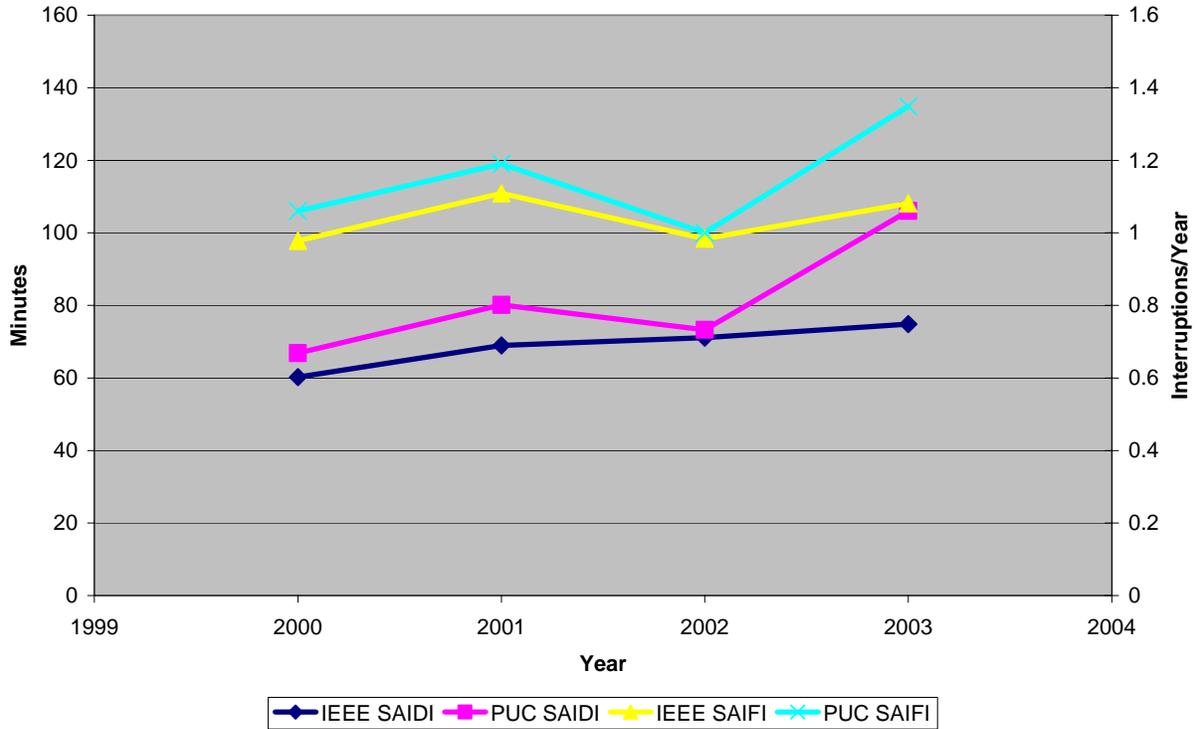
Yes, the Company has reviewed the reliability performance using both the IEEE MED, or 2.5β, methodology and the current Extraordinary Event criteria. The table below reflects this analysis for the years 2000 through 2003, when data collection was most robust, as described in more detail in the responses to Division 1-6 c) and Division 1-15.

	2000	2001	2002	2003
Extraordinary Events:				
Capital	2	0	0	2
Coastal	4	2	1	2
Company	2	2	1	2
MEDs (Company)	3	2	1	5

It should be noted that an Extraordinary Event may encompass more than one day, or part of a day, while a MED is a single day. For example, a single extended storm event lasting three days could be a single Extraordinary Event if the 10% criteria were met at any time during the event, while the same event could result in zero to three MEDs, depending on whether the SAIDI of any of the days exceeded the 2.5β threshold. Extraordinary Events are indicators of the severity of the storm, while MEDs are indicators of the ability of the utility to respond to the event.

It is also important to note that the above table reflects only part of the story. The real proof of the effectiveness of the IEEE MED methodology lies in the resultant SAIFI and SAIDI numbers that identify the reliability trend over time, since such trends are used by companies and regulators to monitor performance and assess penalties or prescribe offsets. The Extraordinary Event definition includes information in the trending that masks true day-to-day performance, thereby obscuring performance and making correct operational and financial decisions more difficult. On the other hand, because the IEEE MED, or 2.5β, methodology analyzes the underlying data and separates MEDs from day-to-day operations, it results in more focused analysis. The resulting data and trends better enable utilities and regulators to make the best decisions possible using more objective data. This is demonstrated in the figure below which reflects the fact that the variability of the reliability metrics is much greater using the Extraordinary Event definition than when applying the IEEE MED definition. The true trend of the metrics is much more obvious utilizing the IEEE MED method.

Company PUC vs. IEEE Performance



Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-12

Request:

(Ref. page 15, lines 1 to 8) Has the Company conducted a historical analysis, identifying the MEDs for Narragansett for some period, and then examining their causes? If so, please provide that analysis along with any supporting materials. In particular, please provide any data which separates MEDs into those caused by Extraordinary Events, as defined in Exhibit RHM-3, and those due to other causes.

Response:

Yes, the Company has conducted a historical analysis in which it has identified MEDs and their causes. As shown below, this analysis has been done for the years 2000 through 2003 given that the data for these years is more complete than that for earlier years.

Ocean State MEDs		Interruption Events	SAIDI (minutes)
Thunderstorm	06/10/2000	15	4.42
Thunderstorm	06/11/2000	88	9.87
Snow Storm	12/17/2000	110	4.31
Lightning	06/11/2001	91	14.49
Lightning	06/12/2001	223	5.07
Wind Storm	09/11/2002	132	6.06
Cable Failure	07/06/2003	30	6.42
Lightning	08/13/2003	69	4.89
Wind Storm	10/15/2003	130	5.86
Wind Storm / Fire	11/13/2003	58	4.95
Wind Storm / Fire	11/14/2003	92	8.95

This can be compared to days classified as Extraordinary Events per the following table:

Coastal - Extraordinary		Capital - Extraordinary		Ocean State - Extraordinary	
Thunderstorm	06/11/2000				
Snow Storm	12/17/2000	Snow Storm	12/17/2000	Snow Storm	12/17/2000
Snow Storm	12/18/2000	Snow Storm	12/18/2000	Snow Storm	12/18/2000
Snow Storm	12/19/2000				
Lightning	06/11/2001			Lightning	06/11/2001
Lightning	06/12/2001			Lightning	06/12/2001
Wind Storm	09/11/2002			Wind Storm	09/11/2002
Wind Storm/Fire	11/13/2003	Wind Storm/Fir	11/13/2003	Wind Storm/Fire	11/13/2003
Wind Storm/Fire	11/14/2003	Wind Storm/Fir	11/14/2003	Wind Storm/Fire	11/14/2003

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-13

Request:

(Ref. page 15, lines 12 to 13) Is it Ms. Warren’s position that the MED concept and associated methodology is “understandable by all and easy to apply”? If so, please explain the basis for this position and provide any supporting materials. Also, please provide a list of states that have adopted the MED concept and methodology as proposed here, as the basis for the SQ Plans.

Response:

As Chair of the IEEE Working Group that developed IEEE 1366, Mrs. Warren has presented the MED concept, along with the associated 2.5β methodology, to members of both the Edison Electric Institute (“EEI”), made up of senior level management of utilities, and the National Association of Regulatory Utility Commissions, (“NARUC”), representing Commissioners and staff of states’ commissions. While the concept may have seemed difficult initially given its newness, Mrs. Warren believes that most EEI and NARUC members developed an understanding of the mechanics of the process and the underlying principles involved. Once it is understood that: a) using the logarithm of the daily SAIDI values does nothing more than put the data into a bell-shaped curve (or a distribution that allows the proper use of the average and standard deviation), b) that the use of the empirically derived 2.5 standard deviations (called 2.5β to distinguish that the data is in the logarithm form) to determine the target level for MEDs produces a resultant metric that shows the real trending of a Company’s reliability, and c) that the calculations can all be easily done within Microsoft Excel, or some similar program, then it is generally accepted that the method is understandable and easy to apply.

As described on pages 13 and 14 of Mrs. Warren’s testimony, the MED methodology consists of seven steps. These steps are easily performed within Microsoft Excel™ or another commonly used program. Once executed within a program, applying the threshold to each day’s performance requires simple “greater than” comparison.

While the Company has proposed that the reliability metrics obtained through the IEEE 2.5β methodology be used in the calculation of its performance targets, the development of performance targets is not part of the strict IEEE methodology. Extending the concept of using lognormal basis to setting of performance targets may have made the MED approach seem more complex.

Currently, several states are in the process of contemplating the use of the IEEE Std. 1366-2003 released in June 2004. While, like Rhode Island, most states require an open docket to make a change of this nature, there are a few exceptions. For example, the Delaware Public Service Commission (“PSC”) specifically wrote rules such that any change in the IEEE Std. 1366 would be automatically adopted by their utilities once the standard was adopted. The PSC expects to maintain this requirement during its next formal rule making to commence in 2005 for adoption by January 2006. In addition, with Commission consent, a utility in British Columbia

filed its 2003 performance report earlier this year using IEEE Std. 1366 as the basis for its submission. The Commission agreed to the utility’s use of the standard despite the fact that formal rules for using the standard had not yet been adopted.

Prepared by or under the supervision of: Cheryl A. Warren

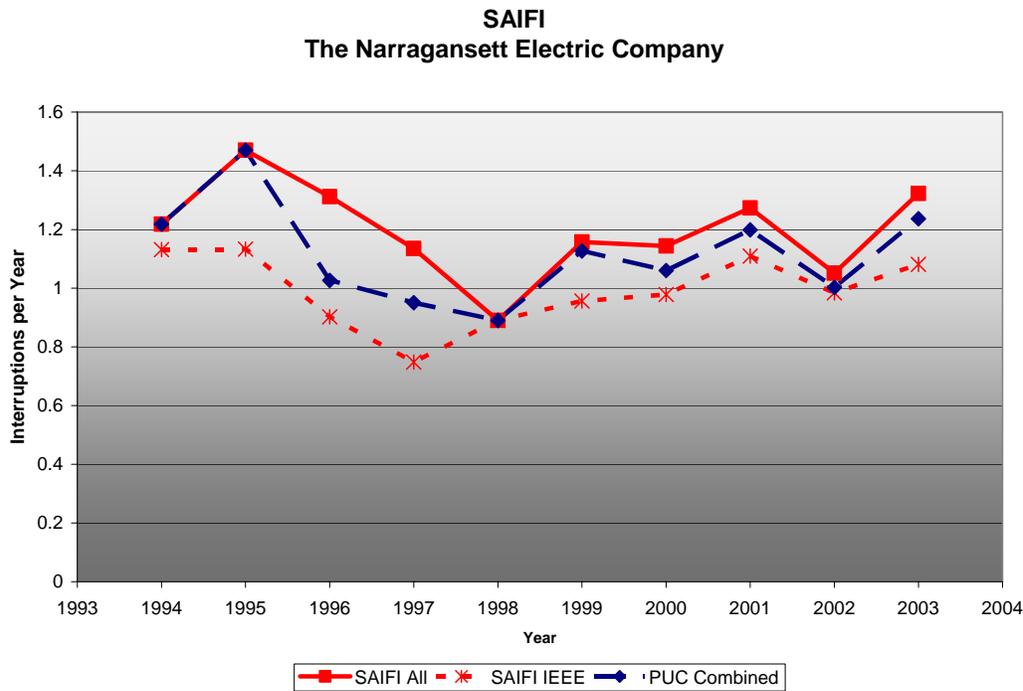
Division Data Request 1-14

Request:

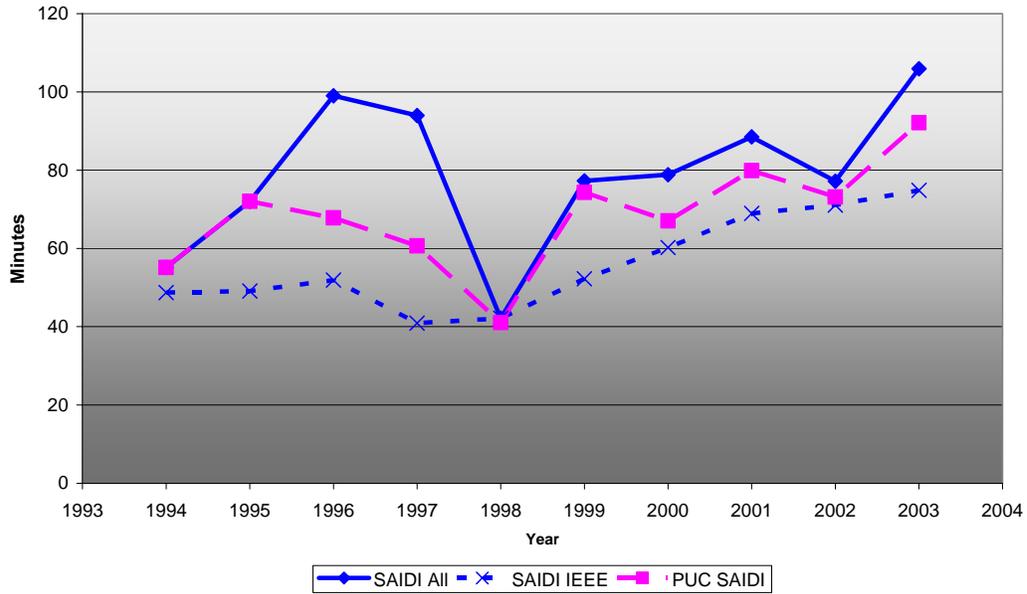
(Ref. pages 22 and 23) Do the lines labeled “SAIDI ALL” and SAIFI ALL” include or exclude Extraordinary Events as defined in Exhibit RHM-3? If so, please provide similar graphs with the Extraordinary Events excluded from the SAIDI ALL and SAIFI ALL graphs.

Response:

The lines labeled “SAIDI ALL” and SAIFI ALL” on pages 22 and 23 of Mrs. Warren’s testimony, and in the charts below, include Extraordinary Events as defined in Exhibit RHM-3. The “PUC Combined” lines in the charts below exclude Extraordinary Events from the SAIDI and SAIFI results. As in the responses to Division 1-6 c) and 1-8 a), these lines reflect a combination of the values for the Capital and Coastal districts under the guidelines of the Original Service Quality Plan, based on the percentage of customers in those districts to the total number of customers (61% in the Capital district and 39% in the Coastal district). As previously indicated, this approach was intended only to provide a view of how Extraordinary Events *may have* been reflected in the data since, in the early years, data was not captured for interruption reporting and therefore Extraordinary Events cannot be precisely calculated and excluded from the Company results.



SAIDI
The Narragansett Electric Company



Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-15

Request:

(Ref. page 24, lines 11 to 16) Please address the following:

- a) Explain in a bit more detail the 20 percent increase mentioned on lines 14 to 15. Provide any materials relied upon to determine or support this increase.
- b) Please describe any studies or analyses the Company conducted to allow it to separate the effects of automated collection and reporting from the effects of other changes that might have been occurring at the same time.
- c) Please describe the “increases seen at other Companies” and supply any supporting materials.

Response:

- a) The implementation of a computerized interruption management system, called the Interruption Disturbance System (“IDS”), in the second quarter of 1999 moved the Company from a field worker driven, paper-based system to one that automatically captured system outage data. Since this new system no longer relied upon the ability of field workers to estimate the number of customers affected, nor on the proper handling, transport, storage, translation and data input of the paper records, the accuracy of the resultant reliability metrics was increased. While it was believed that the prior process was as accurate as other paper-based systems used by other companies, the computerized system does not misplace records nor does it estimate customer numbers. The Company believes that the use of this new system has accounted for approximately a 20% increase in the reported value of SAIDI and a 12% increase in the reported value of SAIFI.

Although a simplistic response might be to tie the effect of implementing new reliability data collection systems to any increase seen in the first year of use, the normal variability of reliability results for any company can mask the true value of that effect in such a short time frame. Thus, a trending analysis, or viewing the effect over a longer period of time, provides a more accurate picture of the true effect of any change introduced to an existing process. This is what was used to identify the increases in the reliability metrics for the Company.

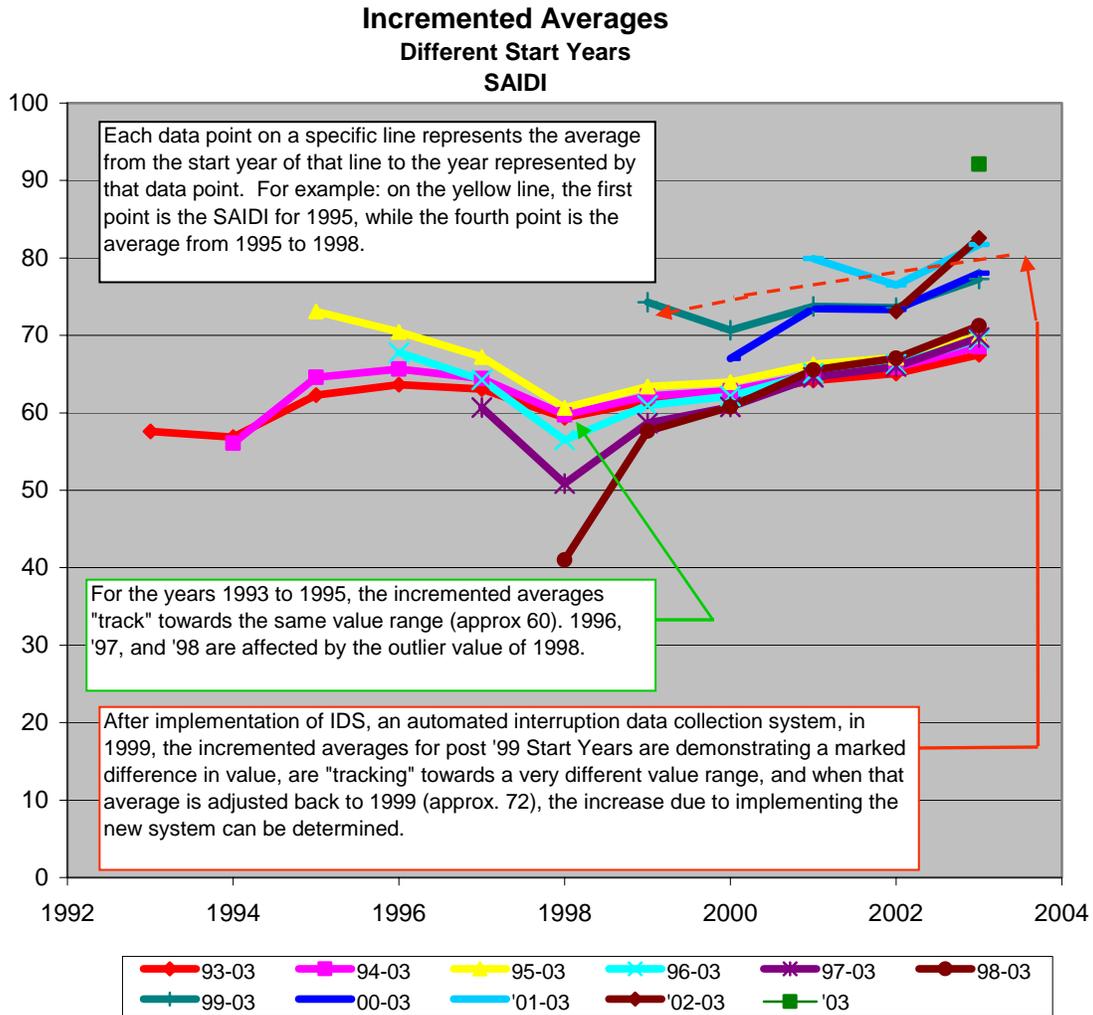
Incremented averaging was used to identify the trending of the reliability metrics. A set of values is created for each year evaluated, each value in a set being the average of all values from the start year to the year being incremented to that set. An example is presented below:

The Narragansett Electric Company
-----SAIDI Incremented Averages-----

Incr. Year ↓	Start Year →											
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
1993	57.60											
1994	56.85	56.10										
1995	62.27	64.60	73.10									
1996	63.65	65.67	70.45	67.80								
1997	63.06	64.43	67.20	64.25	60.70							
1998	59.38	59.74	60.65	56.50	50.85	41.00						
1999	61.51	62.17	63.38	60.95	58.67	57.65	74.30					
2000	62.20	62.86	63.98	62.16	60.75	60.77	70.65	67.00				
2001	64.17	64.99	66.26	65.12	64.58	65.55	73.73	73.45	79.90			
2002	65.06	65.89	67.11	66.26	66.00	67.06	73.58	73.33	76.50	73.10		
2003	67.52	68.51	69.89	69.49	69.73	71.23	77.28	78.03	81.70	82.60	92.10	

In the above table, the actual SAIDI for each year is the first value found in the “Start Year” column. The next value in the column is the average of that year and the SAIDI value for the next year. The third value in the column is the average of the Start Year SAIDI and the SAIDI for the next two years. This is continued until all years from the start year have been included.

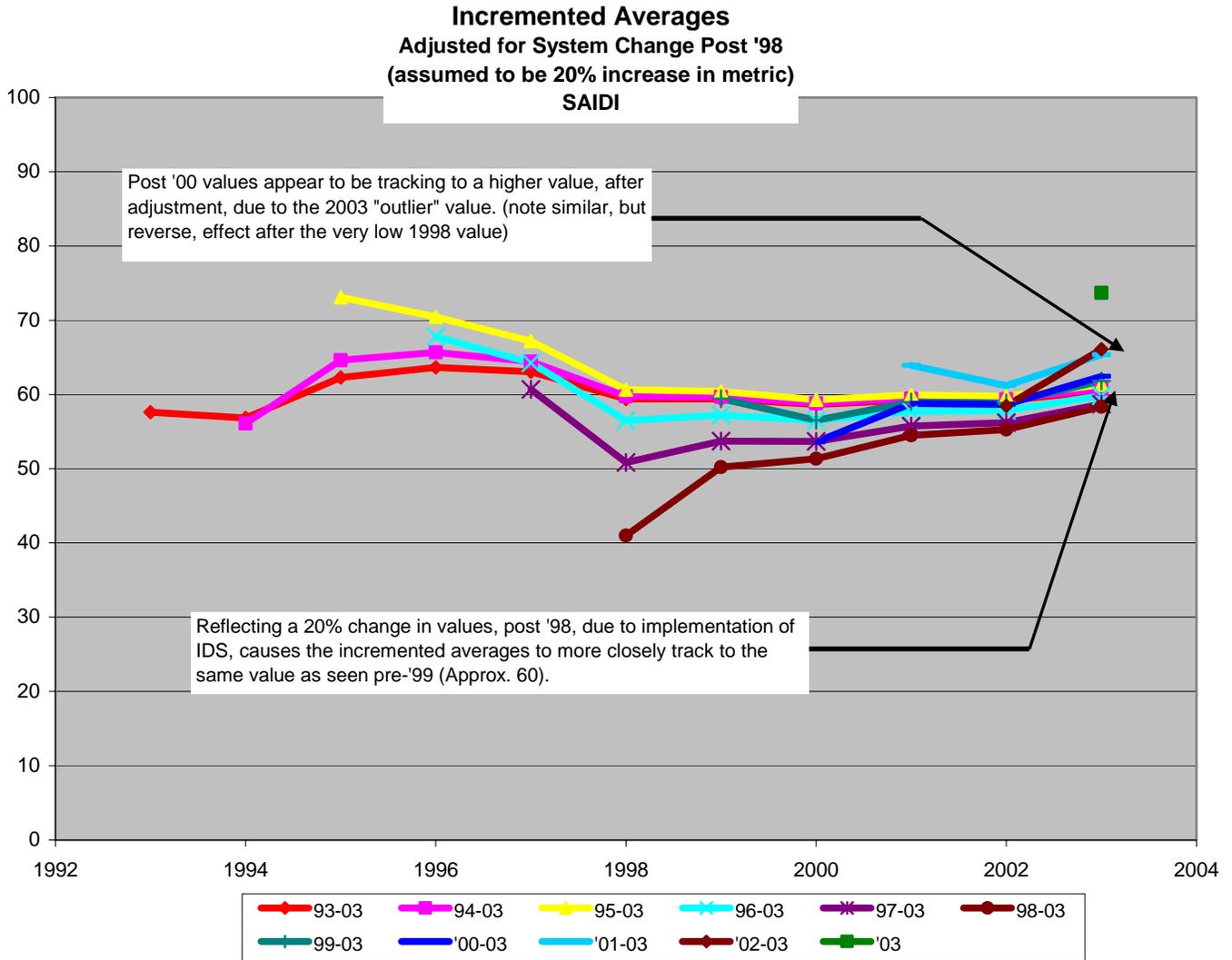
This method, when lines are drawn for the values in each of the individual Start Year columns, can show the trend for the metric and any significant change in the character of the data. This can be most easily seen in graphical form, as follows:



The change in the trending of the incremented averages between 1998 and 1999 suggests a basic change in the data set. Aberrations that normally occur, such as the seemingly very low value in 1998, will cause temporary fluctuations in the incremented averaging trends, as can be seen in the Start Year 1997 and even 1996 lines. However, as can be seen, these have no long-term effect on the inherent average value of the trends. The shifting of the trend lines from 1999 onward are not caused by temporary aberrations in the data, but, by the effect of introducing a new data collection system.

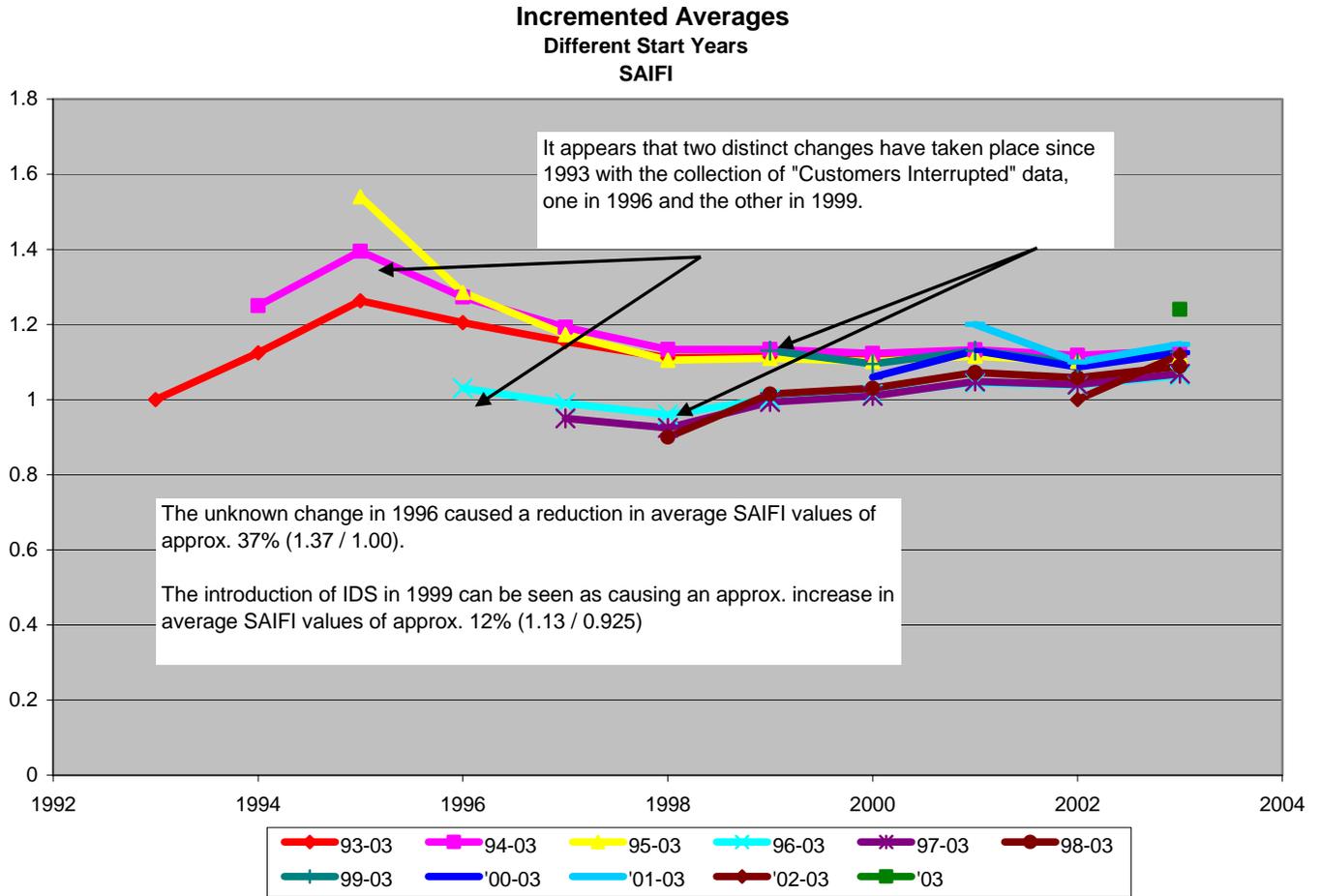
The effect of this system addition on the long-term average of the reliability metric can be determined by comparing the trend up to 1998 to the trend after 1999. As can be seen in the above chart, the effect is the percent difference from a value of 60 in 1998 to a value of 72 in 1999, or a 20% increase.

The validity of this 20% increase can be determined by reducing the values of the reliability metric from 1999 to 2003 by 20% and redoing the previous chart. The result of this is shown in the chart below:



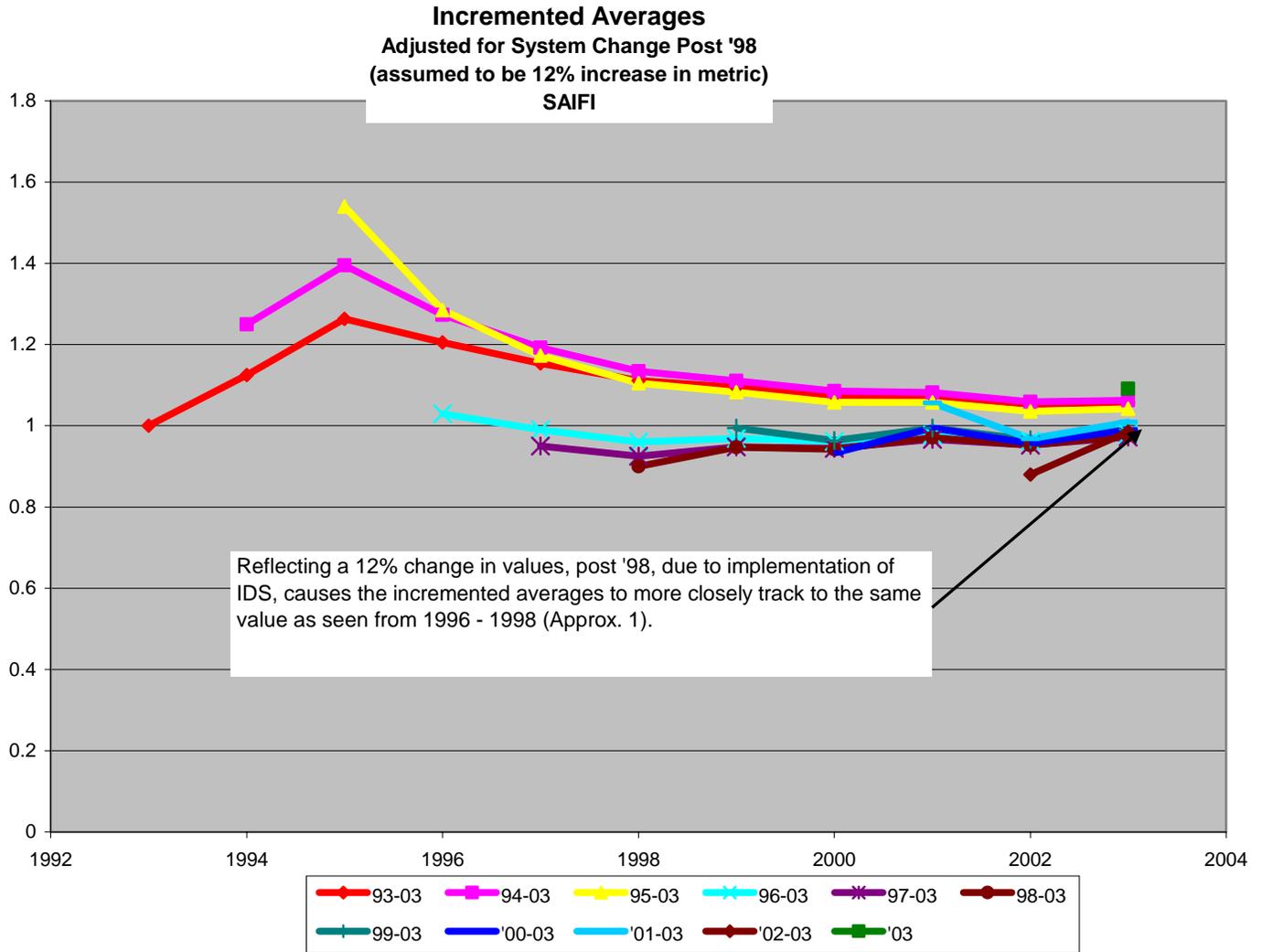
The 20% adjustment, reflecting the effect of the introduction of the IDS, has brought the incremented averages of the Start Years post-1998 to the same level as the values pre-1999. This is especially true with the 1999 and 2000 trends, which are less affected by the recent outlier value posted in 2003. The effect that this outlier value has on the last few years of data is similar to the effect that occurred when the very low value was posted in 1998. These extreme values have a marked effect on the previous two years’ trends, but, as can be noted on the first chart, the trends do recover. It will require a couple more years of data to determine if deterioration in this reliability metric is occurring, or if the 2003 value was just an aberration.

The effect of implementing the IDS on the value of SAIFI can be discerned in the same manner. The chart for SAIFI is below:



As noted in the chart, the introduction of the IDS in 1999 caused an estimated 12% increase in the average reported SAIFI values.

In the same manner as that used for SAIDI, the validity of this 12% increase can be determined by reducing the values of the reliability metric from 1999 to 2003 by 12% and redoing the previous chart. The result of this is shown in the chart below:



The chart above clearly depicts the effect of some system change, or a change in the method of collecting the manual records, that occurred in 1996. It is also clear that the incremented average trend lines from 1996 forward all converge to the same value, validating the estimated 12% change in the average SAIFI value due to the introduction of the computerized interruption reporting system, IDS.

- b) The method used to identify the effects on the reliability metrics due to the introduction of a computerized interruption reporting system, as presented in a) above, can also discern the impact of other changes taking place, such as a reduction in the overall reliability of the system.

In those charts that show the effect of adjusting for the impact of the introduction of a new data collection and reporting system, the validity of the assumed effect is shown by the fact that the trends all converge to the same value. A change in the overall system reliability will be seen as a change in slope of those adjusted trends. The slope of the trend lines for those Start Years with the most pertinent data, those from

the timeframe prior to the last noted change, best indicate the deterioration or improvement of system reliability. As noted in the above charts, there is no change in slope of those long-term trend lines that are not within the expected changes from the normal variability of the data. The change in the level of the reliability metrics can be attributed wholly to the introduction of the computerized interruption reporting system.

- c) Nearly every utility that has implemented new processes and systems to automate interruption data collection to a fully connected model has experienced an increase in index values as a result of changing their processes and systems. In Mrs. Warren’s capacity as Chair of the IEEE Working Group that developed IEEE Std. 1366 and as a consultant, she worked with several utilities on this issue. She personally witnessed one company’s indices increase by 125% in the year after an outage management system implementation. In that case, the commission in that state required the utility to monitor and use a statistical approach to demonstrate true index values before and after the implementation and corresponding process changes. In most cases indices rose between 20% and 40%.

The principle cause of the rise in index values stems from the fact that most outage tracking systems were implemented solely to assist in restoration efforts, rather than for outage reporting purposes. Because it was sufficient to know that a few hundred or less than a hundred customers were affected by an outage in order to properly focus restoration efforts, knowing precise customer counts was not critical. However, such data would be required in order to properly report reliability metrics. Today, many utilities are using these legacy systems to report reliability metrics despite the fact that the systems were built to serve a different purpose. Thus, it is natural that they are often not capable of automatically assessing customer counts or restoration times that are necessary for accurate reporting of reliability performance. Once new systems are put in place, all customer interruptions are captured and proper durations are recorded, making the indices appear to worsen.

Several industry papers have been written describing this issue. One such paper is the EPRI report titled: “Distribution Reliability Indices Tracking Within the United States”, (rpt-1008459), May 2003. In this report, EPRI sites cases where indices rose up to 75% above historic levels.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-16

Request:

(Ref. page 28, line 6 to page 29, line 3) Is it the Company’s position that the target bands set in the Original SQ Plan were set, based on an assumption that the historic SAIDI and SAIFI data used was “Gaussian” (i.e., normally distributed)? If so, provide any material relied upon to support this position. More generally, please provide any information showing that the question of whether the historic data was Gaussian was taken into account in developing the Original SQ Plan.

Response:

Even though it is not explicitly stated in the Original SQ Plan, the Company believes that it is generally assumed that underlying data is Gaussian when the mean (μ) and the standard deviation (σ) are used to compute targets. Please see the response to Division 1-2.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-17

Request:

(Ref. page 32, lines 11 to 19) For each of the years 2001, 2002, and 2003, please indicate the dollar amount of the penalty, if any, that Narragansett would have paid using the IEEE Methodology and the penalty under the Original SQ Plan. List annual penalties separately for SAIDI and SAIFI performance.

Response:

Using the same years to set the performance targets as in the Original Service Quality Plan (1993-1999), the SAIFI and SAIDI penalties that would have been paid under the Original Service Quality Plan versus those that would have been paid using the IEEE methodology are shown in the table below (in millions of dollars). This is done for comparative purposes only; however, because, as discussed in earlier responses, interruption data was limited during this time period, resulting in performance targets that are artificially stringent and inappropriately low. Please refer to the response to Division 1-4 for additional information.

	2001	2002	2003
<i>Original Service Quality Plan:</i>			
Reliability - NECo Capital Frequency	(\$0.023)	\$0.000	\$0.000
Reliability - NECo Coastal Frequency	\$0.000	\$0.000	(\$0.295)
Reliability - NECo Capital Duration	(\$0.500)	\$0.000	(\$0.231)
Reliability - NECo Coastal Duration	\$0.000	\$0.000	(\$0.500)
Total (Penalty)/Offset	(\$0.523)	\$0.000	(\$1.026)
<i>New Service Quality Plan:</i>			
Reliability - NECo Company Frequency (IEEE)	(\$0.045)	\$0.000	\$0.000
Reliability - NECo Company Duration (IEEE)	(\$1.000)	(\$1.000)	(\$1.000)
Total (Penalty)/Offset	(\$1.045)	(\$1.000)	(\$1.000)

Prepared by or under the supervision of: Cheryl A. Warren and Robert H. McLaren

Division Data Request 1-18

Request:

(Ref. page 29, lines 11 to page 31, line 4) Please address the following:

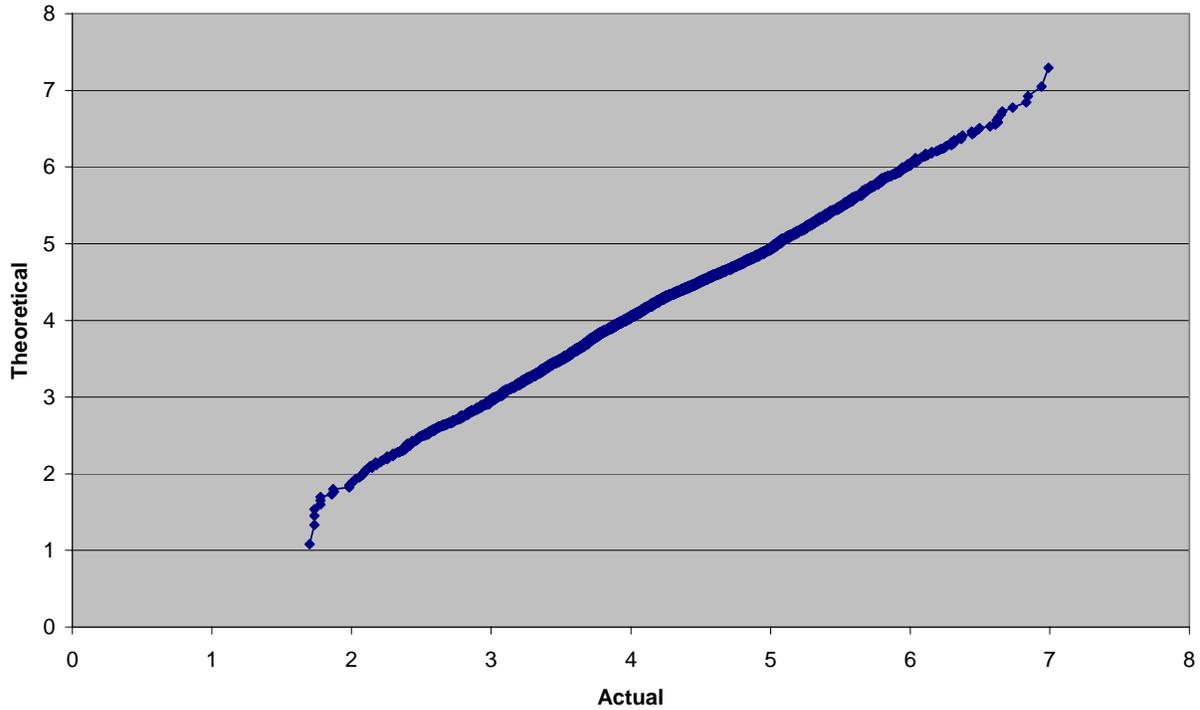
- a) Is it possible to test statistically to see if the SAIFI and SAIDI data used to develop Figures 12 and 13 are, in fact, lognormal in nature? If not, please explain why.
- b) Prior to the filing of Ms. Warren’s testimony, were tests of the type mentioned in a) performed? If so, did they confirm the lognormal nature of the data? Please provide all supporting materials.
- c) Please provide any test results beyond those provided in response to b) which address the lognormal nature of the data used to develop Figures 12 and 13.

Response:

- a) Mrs. Warren’s testimony on page 21, lines 1-6, states “...that reliability data is most closely represented by the lognormal distribution”. The IEEE Working Group on System Design spent several months working with a multitude of data sets from numerous companies throughout the United States and Canada, testing different distributions to determine which one best identified major events. What the Working Group found was that while the data is not exactly lognormal, it most closely resembles lognormal and much more accurately describes the nature of the actual data than does a suggestion that it is Gaussian. The fact that the data is not exactly lognormal does not diminish the effectiveness of using the distribution because the correct days are identified, which allows appropriate analysis to be conducted.

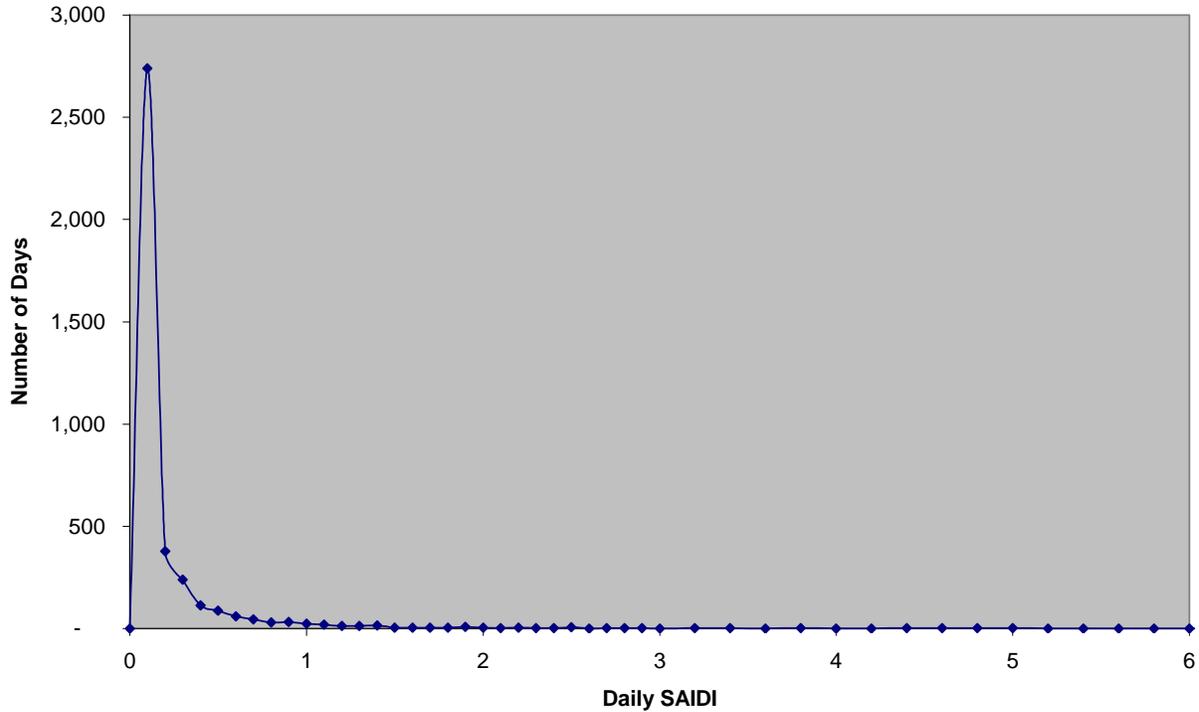
That being said, yes, it is possible to test statistically to determine if the data is represented by the lognormal distribution. One method of conducting such a test is to plot the actual data against the theoretical data. If the data is perfectly lognormal, then a straight line will be formed. In the figure shown below, which reflects Company data from 1993 to 2003, the data, for the most part, falls on a straight line, indicating that it is lognormal. Some variation does exist at the tail, which is the reason the Working Group stated that the lognormal distribution most closely represented reliability data.

Lognormal Test - Ocean State



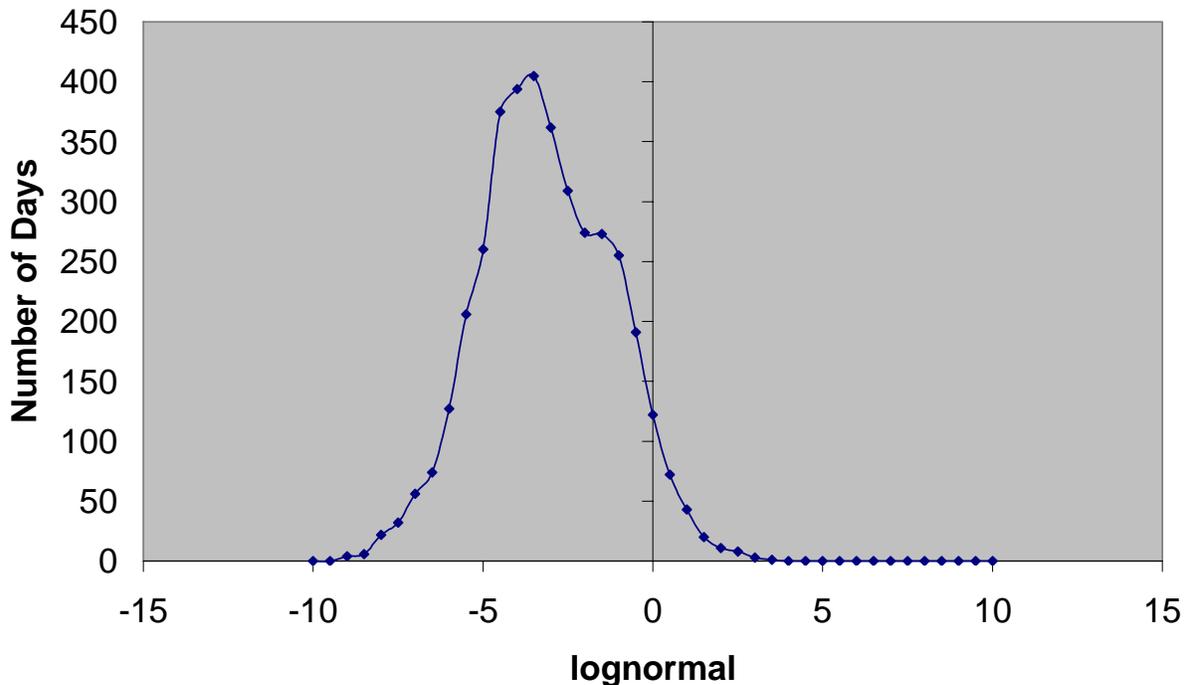
A second method of testing the lognormal nature of the data is to plot daily SAIDI and then to plot the lognormal of the daily SAIDI. In the figure below, which shows daily SAIDI plotted by day from 1993 to 2003, it is clear that the data is skewed to the right and therefore shaped lognormally.

RI Daily SAIDI 1993-2003



Taking the next step to transform this data into lognormal space and plotting the resulting data yields the figure below. Notice that it looks mostly like a “bell-shaped” curve. Using the data in this space allows the use of the average and standard deviation which, in log space, are known as α and β .

**Narragansett Electric Company
1993 - 2003**

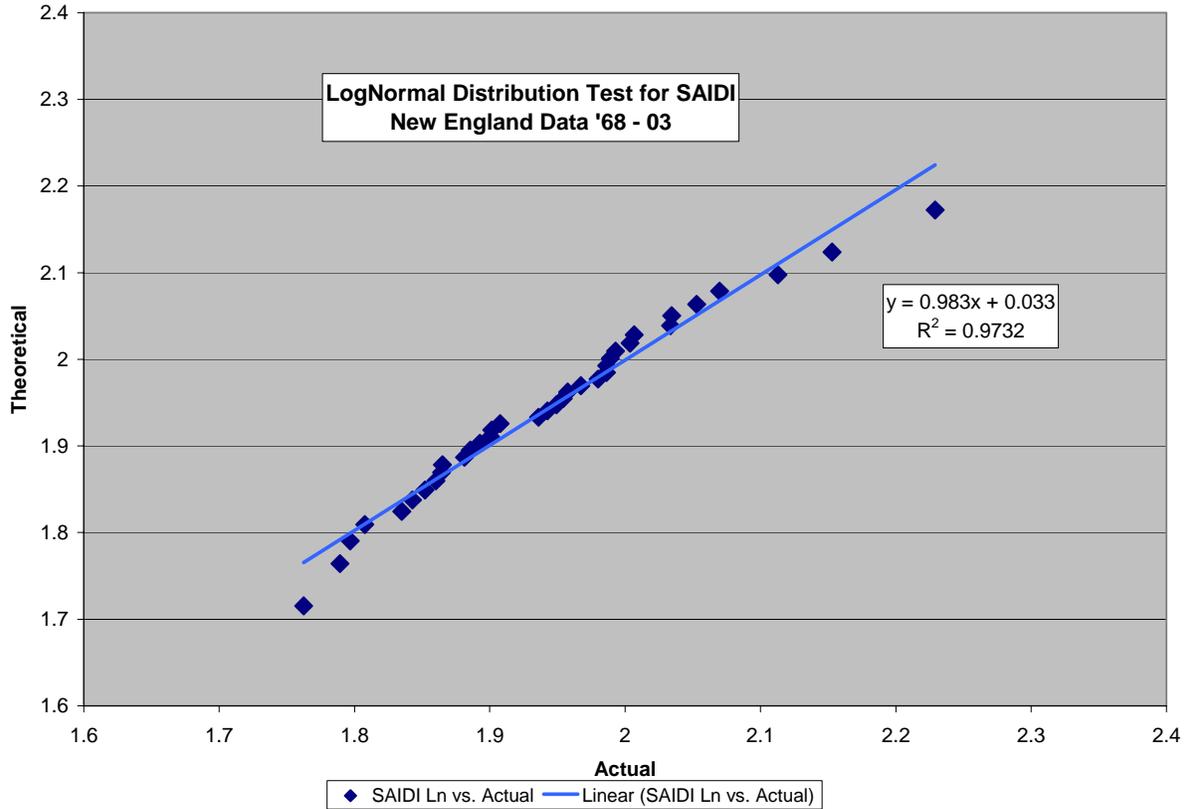


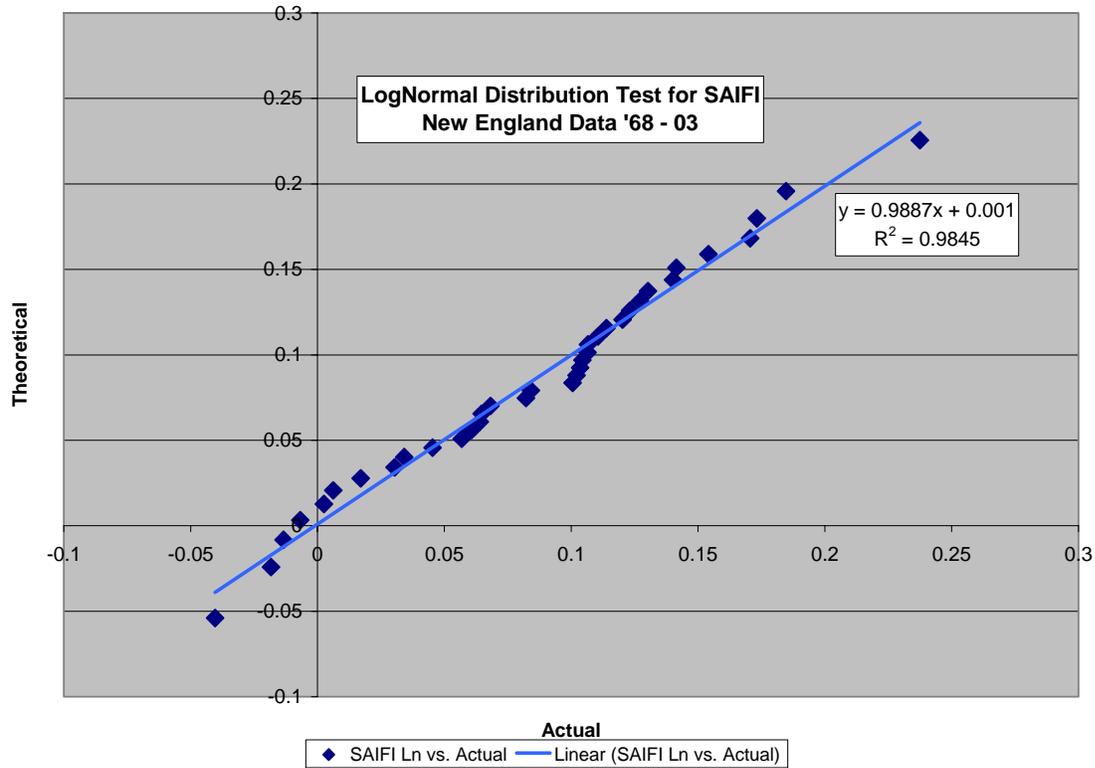
Please refer to the following link for a reference site pertaining to lognormal concepts:

http://www.weibull.com/AccelTestWeb/characteristics_of_the_lognormal_distribution.htm.

- b) Prior to filing the testimony, data from the Company was not tested to determine how closely it approximated the lognormal distribution. As described in the response to Division 1-18 a) above, the IEEE Working Group tested numerous data sets from utilities throughout the United States and Canada. All sets tested were most closely approximated by the lognormal distribution. Given the volume of data analyzed by the Working Group and the fact that the analysis consistently yielded the conclusion that using the lognormal distribution was most appropriate for determining MEDs, the methodology was applied to the Company. Subsequently, the Working Group’s conclusion has been supported through analysis of the Company’s own data that has been performed as part of this Docket.
- c) Figures 12 and 13 on pages 30 and 31 of Mrs. Warren’s testimony address the lognormal nature of the yearly reported reliability metrics. While there are eleven years of data for the Company available, this is inadequate to formulate an understanding of the distribution of the data. Instead, the Company offers a surrogate data set, that of all of the National Grid USA New England, consisting of SAIDI and SAIFI values that exist from 1968 forward. Given the nature of system reliability, it is

reasonable to assume that the distribution of the data would be similar for a part of the region measured as for the region as a whole. The following charts present the lognormal test of this yearly system data:





As can be readily seen, the distribution of the data, for both SAIDI and SAIFI, demonstrates lognormal characteristics.

Prepared by or under the supervision of: Cheryl A. Warren

Division Data Request 1-19

Request:

(Ref. page 3, lines 12 to 16) Did Mr. Sorgman participate in the negotiations leading to the settlements in Docket Nos. 2930 and 3617? If so, please describe his role in the negotiations.

Response:

No, Mr. Sorgman did not participate in the negotiations leading to the settlements in Docket Nos. 2930 and 3617.

Prepared by or under the supervision of: Mark N. Sorgman

Division Data Request 1-20

Request:

(Ref. page 6, lines 12 to 13 and Exhibit RHM-1, page 5) Please address the following:

- a) Provide data on telephone calls answered within 20 seconds for the years 2001 to 2003 which does not include calls completed within the VRU.
- b) Please provide a version of page 5 similar to that in Exhibit RHM-1 but based on data for 2001 to 2003 that excludes calls answered within the VRU.

Response:

- a) As reflected in the response to Division 1-6 e), the percentage of telephone calls answered within 20 seconds for the years 2001 to 2003 which does not include calls completed within the VRU is shown below. Because VRU calls are included in the percentage calculation beginning in the year 2000 in the proposed New Service Quality Plan in Docket No. 3628, data for 2000 is also reflected below to exclude VRU calls.

Year	% of Calls Answered within 20 Seconds (CSR calls only)
2003	92.4%
2002	82.6%
2001	44.8%
2000	74.1%

- b) A version of page 5 similar to that in Exhibit RHM-1 but based on data for 2000 to 2003 that excludes calls answered within the VRU is shown below. Because VRU calls were tracked by the Company beginning in the year 2000, the percentage of calls answered within 20 seconds for 2000 excludes VRU calls as well.

